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Souvenirs d'un Voyage dans la Tartarie, le Thibet, et la Chine, pendant les Années 1844, 1845, et 1846. Par M. Huc, Prêtre Missionnaire de la Congregation de St. Lazare. 2 vols. Paris: 1850.

ABOUT the end of 1846, Mr. Alexander Johnston, son of the late Sir Alexander, and secretary to her majesty's minister plenipotentiary in China, was fellow-passenger on board the steamer from Hong-Kong to Ceylon with a French Lazarist Missionary, named Joseph Gabet. It appeared that M. Gabet was then on his way from China to Paris, intending, should circumstances be favorable on his arrival, to bring under the notice of the French government the ill treatment which he himself and a brother missionary had experienced at Lhassa, from *Ke-shen*, resident on the part of the Emperor of China at the court of the Grand Lama. Some of our readers will recognize in this name that of the Imperial Commissioner who was opposed to Captain Elliot, in 1839, at Canton; and who, on account of the disasters which befell the Chinese arms, was disgraced, plundered, and even condemned to death by the emperor, but has since, with marvellous expedition, contrived to regain nearly all his former honors and credit, and even a great portion of his former wealth, which was colossal, as we shall see. Mr. Johnston found the narrative of M. Gabet so curious and interesting, as the most recent and authentic account of Thibet in its relation to China, that he noted down the principal heads at the time, and, on returning to his official post, presented the manuscript to Sir John Davis, who forwarded a copy in his despatches to Lord Palmerston.

Nothing more was heard about the matter, until the appearance of these two volumes, by M. Huc, the companion of M. Gabet in all his adventures. A more interesting as well as diverting book has seldom issued from the French press. The qualifications of a Humboldt are not to be expected in a missionary priest. And though it should contribute nothing to the geographer or *savant*, we might well be grateful for its information regarding countries nearly inaccessible to Europeans; but this information is conveyed in such an inexhaustible strain of good humor and fun, as amply to repay the perusal of any class of readers. In these points M. Huc bears some resemblance to his English namesake, Theodore, as we may almost call him.

Some eight years before the late "Papal Aggression," His Holiness of Rome took a rather smaller liberty with the Emperor of China, by appointing a vicar apostolic to Mongol Tartary. The next thing was to ascertain, if possible, the extent and nature of this gigantic vicariat. However dreadful the intolerance and oppression under which Romish priests groan among us, they are a good deal worse off in the Celestial Empire; and yet there, strange to say, they are as quiet as lambs, and the government seldom hears of them, except when some stray missionary is detected and packed off to the coast, for foreign shipment. MM. Gabet and Huc, who happened to be residing a

little to the north of the Great Wall, in Eastern Tartary, at the commencement of 1844, were appointed by their spiritual superior to make their way as well as they could through Western Tartary to Lhassa, the capital of Thibet, and the holy see of Lamanism. This might look, at first sight, like taking the bull by the horns. The reader will find, however, to his surprise, that all the opposition they experienced was not *ecclesiastical*, but *lay*—not religious, but political; and that while they received every encouragement and hospitality from the Lama's government, they were baffled, and at length expelled, by the exertions of the Chinese resident, or ambassador, *Ke-shen*.

In China a Romish bishop or priest is obliged to pass himself off, as well as he can, for a native, in the lay dress of the country; but they were now going to enter a nation of priests, and therefore prepared to disguise themselves as Lamas. Off went the tail, which had been cherished ever since their departure from France, leaving the head entirely shaven. A long yellow robe was fastened on the right side by five gilt buttons; it was drawn round the waist by a red girdle. Over this was worn a short red jacket, without sleeves; or, as they call it in Chinese, "a back and breast;" having a narrow collar of purple velvet. A yellow hat with broad brim, and surmounted by a red silk button, finished off their new costume. Their only attendant was a young Mongol neophyte, named *Sandadchiemba*, who is thus described:—"Un nez large et insolemment retroussé, une grande bouche fendue en ligne droite, des lèvres épaisses et saillantes; un teint fortement bronzé, tout contribuait à donner à sa physionomie un aspect sauvage et dédaigneux." This Tartar Adonis had charge of two camels and a white horse, which, with a tent and a dog to guard it, completed the equipment of our adventurous missionaries for the desert. They had no other guide for their route than a compass and a map of the Chinese empire, published in Paris.

The apprehensions expressed by the friends whom they left behind, regarding what they might suffer in the journey to Lhassa, were fully answered in the event. M. Gabet well-nigh sank under the extreme hardships of this savage and nomadic life; first across an inhospitable desert, and then over mountains to which the Alps are trifles. From plunder they escaped tolerably free, though the Mongol robbers would seem to be the civillest in the world. Instead of rudely clapping a pistol to your breast, they blandly observe, "Venerable elder brother, I am tired of going a-foot, please to lend me your horse; I am without money, do give me the loan of your purse; it is very cold to-day, let me have the use of your coat." If the venerable elder brother has the charity to comply, he is duly thanked; but, if not, the humble appeal is supported by the cudgel; and, should this not do, by something more coercive still. Very little better than the professional robbers were any bands of Chinese soldiers with whom they might have the bad luck to fall in, and whose neighborhood, therefore, they diligently shunned. During the war with England, on the north-east coast, these

ragamuffin troops were so dreaded by their own countrymen that, when the process of civilized warfare came to be known and understood by the Chinese people, the latter often welcomed us as deliverers, and their satisfaction was increased when the public granaries were thrown open to them for nothing.

Our missionaries had a characteristic account of the war with England from a Tartar, whom they met in the desert :

"What, were all the Tartar banners called together?"—"Yes, all. At first it passed for a very small matter; every one said it would never reach us. The troops of *Kilat** (China) went first of all, but they did nothing. The banners of Solon also marched, but they could not resist the heat of the south. The emperor then sent us his sacred order. * * * On the same day we marched to Peking, and from Peking we went to *Tien-tsin*, where we remained three months."—"But did you fight—did you see the enemy?"—"No; he did not dare to show himself. The Chinese protested everywhere that we marched to certain and unavailing death. 'What can you do,' said they, 'against these sea-monsters?—They live in the waters like fish. When least expected, they appear on the surface, and throw combustible balls of iron. When the bow is bent against them they take again to the water like frogs.' Thus it was they tried to frighten us, but we soldiers of the eight banners are ignorant of fear. The emperor had provided each leader a Lama instructed in medicine, and initiated in all the sacred auguries. They would cure us of the diseases of climate, and save us from the magic of the sea-monsters—what then need we fear? The rebels, on hearing that the invincible troops of *Tchakar* approached, were seized with alarm, and asked for peace. The sacred master (*Shing-chu*) of his immense mercy granted it, and then we returned to our pastures, and to the charge of our flocks."

It is known for certain that when the British force had reached Nanking and the grand canal in 1842, the emperor so fully expected a visit at Peking that he stationed a force at *Tien-tsin*, as stated by the Tartar, and made every preparation to decamp into Tartary himself. In the confusion of packing up, some dexterous persons contrived to rob the treasury of several millions, and to this day the culprits have never been detected. The parties considered responsible, however, were, with all their relations and connexions, made answerable for the restoration of the treasure to the third and fourth generation. Without adverting to this circumstance, M. Huc observes, in another place, that during the progress of the war with the English, "nous savions que l'empereur était aux abois, et qu'il ne savait où prendre l'argent nécessaire pour empêcher de mourir de faim une poignée de soldats qui étaient chargés de veiller à l'intégrité du territoire Chinois."

The most distinguished hero, sent by the emperor to exterminate the English during our war, was a Chinese general named Yang. This man had enticed the unfortunate Mahomedan chief, *Jehang-hir*, in the war with Cashgar, to trust himself in his hands, and then sent him in a cage to Peking, where, after amusing the emperor, he was cruelly put to death. M. Huc heard the following account of Yang's tactics :—

As soon as the battle began he tied his beard in two large knots, to keep it out of his way; and then

posted himself in the rear of his troops. There, armed with a long sword, he pressed his troops into action, cutting down without mercy such as were cowardly enough to fall back. This appears to be an odd style of commanding an army, but those who have lived among the Chinese will see that the military genius of General Yang was founded upon knowledge of his troops.

His tactics certainly did not succeed against our troops, and as he never made his appearance, it is supposed that he occupied his favorite place of honor at the tail of the rear guard, and led gallantly in a retreat. "We have asked," says M. Huc, "of several mandarins why the Bataouan Yang had not exterminated the English; all have answered that it arose from his compassion."

We have a terrible description in these volumes of Tartar uncleanness, and several of the details on this subject are quite unpresentable. The dogma of the transmigration of souls acts, it seems, with some as a protection to the vermin with which they are infested. The interior of their tents is repulsive and almost insupportable to those unaccustomed to the odors that prevail there. Dirty as the Chinese may be, their northern neighbors far exceed them; the former at least have taken it upon themselves to settle the question, by calling the latter *Chou Ta-tse*, "stinking Tartars," as systematically as they call Europeans "foreign devils."

This clever and indefatigable, but not too scrupulous, race, have nearly displaced the Manchows in their original country to the north-east of the Great Wall, and almost as far as the river *Saghaliën*.^{*} The Chinese are the men of business and shopkeepers in all towns, and have very little mercy on the comparatively honest and simple Tartars. It is impossible to help laughing at the stories of their ingenious rascality. They are in fact the *chevaliers d'industrie*—the *Scapins* and *Mascarilles* of Eastern Asia. M. Huc, in the following passage, gives an account of their tricks, which might have applied very closely to the way in which they treated our poor sailors in the south of China :—

When the Mongols, an honest and ingenious race as ever was, arrive in a trading town, they are immediately surrounded by Chinese, who carry them off home as it were by force. Tea is prepared, their beasts looked to, a thousand little services rendered. They are caressed, flattered, magnetized, in short. The Mongols, who have nothing of duplicity in their own character, and suspect none in others, end by being moved and touched by all these kindnesses. They take in sober earnest all the professions of devotion and fraternity with which they are plied, and, in a word, persuade themselves that they have had the good fortune to meet with people they can confide in. Aware, moreover, of their own inaptitude for commercial dealings, they are enchanted at finding brothers—*Ahatou*, as they call it—who are so kind as to undertake to buy and sell for them. A good dinner *gratis*, which is served in a room to the rear, always ends by persuading them of the entire devotion of the Chinese confederacy. "If these people were interested," says the honest Tartar to himself, "if they wished to plunder me, they would hardly give me such a good dinner for nothing; they would not expend so much money on me. It is generally at this first repast that the Chinese bring into play all that their character combines of villany and trickery. Once in possession of the poor Tartar, he never escapes. They serve him with spirits in excess, and

* Thus, the Chinese town at Moscow is called *Kitaigorod*, and Marco Polo always calls China *Kathay*, anglicized, *Kathai*.

* Maintenant on a beau parcourir la Mantchourie jusqu'au fleuve *Amour*. C'est tout comme si on voyageait dans quelque province de Chine.

make him drink till he is fuddled. Thus they keep possession of their victim for three or four days, never losing sight of him, making him smoke, drink, and eat; while they sell his live stock, and purchase for him whatever he may want, charging him generally double or triple for everything.

M. Huc puts in a strong light that appropriation to themselves of Manchow, or Eastern Tartary, (the country of their last conquerors,) which has been effected by the Chinese within something more than a century, and to which we have already alluded. In a map of this country, constructed by the Jesuits, Père Duhalde states his reason for inserting the Tartar names, and not the Chinese. "Of what use," says he, "would it be to a traveller in Manchouria to know that the river *Saghalien* is called by the Chinese *Hé-loung-Keang*, (river of the Black Dragon,) since he has no business with them, and the Tartars, with whom he has to deal, know nothing of this name!" "This observation might be true in the time of Kanghy," says M. Huc, "when it was made, but the very opposite is the fact at present; for the traveller in Manchouria now finds that he has to deal with China, and it is of the *Hé-loung-Keang* that he hears, and not of the *Saghalien*." In our own colonies, the rapidly increasing numbers and wealth of the Chinese, where they exist, are apt to give them a degree of presumption which, with the aid of their vices, might make them troublesome, were it not for the wholesome dread they entertain of European power, wherever they happen to be really acquainted with it.

M. Huc explains how Thibet, and even Mongol Tartary, to a considerable extent, is a nation of Lamas. He says he may venture to assert that in Mongolia they form at least a third of the whole population. In almost every family, with the exception of the eldest son, who remains "*homme noir*,"* all the rest of the males are destined to be Lamas. Nothing can be more obvious than the fact that, in China Proper, Buddhism and its temples are in ruins, and the priests left in a starving condition; while, on the other hand, the government gives every encouragement to Lamanism in Tartary. The double object is said to be thus to impose a check on the growth of the population, and at the same time render that population as little warlike as possible. The remembrance of the ancient power of the Mongols haunts the court of Peking. They were once masters of the empire, and, to diminish the chances of a new invasion, the study is now to weaken them by all possible means.

With this large proportion of the male population condemned to celibacy, M. Huc gives us the following reasons for his thinking that polygamy, under all the circumstances, is the best thing for the Mongol Tartars.† It seems generally to have existed in the pastoral and nomadic state.

* This is a distinguishing term for the Laity, who wear their black hair, while the Lamas shave the whole head.

† M. Huc is here treating of the Mongol Tartars; not of the Thibetians. Father Regis, in his memoir annexed to Duhalde, speaking of the polyandry of Thibet, states expressly that "the Tartars admit of no such irregularity." Turner, Moorcroft, and Skinner found a plurality of husbands common at Teshoo Loomboo, Ladak, and on the Himalayas. We found it too in Ceylon, as Cæsar had found it in Britain. Barbarous as the custom seems to us, and inexplicable by any supposed disproportion of the sexes, we perceive no more satisfactory explanation of its existence among the Thibetians, than among the Nairs in Malabar. There is no incompatibility, it is true, between polyga-

Polygamy, abolished by the gospel, and contrary in itself to the happiness and peace of families, should, perhaps, be considered as a good for the Tartars. In the actual state of their society, it acts as a barrier to the libertinage and corruption of manners. Celibacy being imposed upon the Lamas, and the class which shaves the head, and lives in the *lamaeries*, being so numerous, if the daughters could not place themselves in families in the rank of secondary wives, it is easy to imagine the disorders which would arise from this multiplicity of young women left to themselves without support.

The married state, however, is anything but the conjugal, in the literal and derivative sense of the term. The husband can send back the lady to her parents without even assigning a reason. He is quits by the oxen, the sheep, and the horses which he was obliged to give as the marriage present; and the parents, it seems, can sell the same merchandise over again to a second bidder!

Our travellers, in their progress westward, had to cross the Yellow River more than once where it makes a bend northwards through the Great Wall and back again, enclosing in this curve an area of some three degrees square, the miserably waste and sandy country of the *Ortous*. Unhappily for the poor missionaries, this ruthless and ungainly stream (which a late emperor justly called "China's sorrow") was in its frequent condition of overflow, and we have a pitiable description of the miseries endured by themselves and their camels, of all beasts the least adapted to deal with floods. The waters of the Yellow River, pure and clear at their source among the Thibet mountains, do not assume their muddy tinge until they reach the alluvial tracts of the *Ortous*, where they spread over thousands of acres during the inundations, altogether concealing the bed of the stream. Being from this point always nearly on a level with the country through which they flow, this defect of *encaissement* is the cause of disastrous accidents, when the rapid stream is swollen by melting snows near its source. The same velocity, which charges the river thickly with comminuted soil, prevents its deposition on the passage until it reaches the provinces of *Honan* and *Keangnan*, where the actual bed of the river is now higher than a great portion of the immense plain through which it runs. This evil being continually aggravated by further depositions of mud, a fearful catastrophe seems to overhang that unfortunate region; at the same time that the constant repair of the dikes taxes the ingenuity, while it exhausts the treasury, of the Chinese government. Sir John Davis offered to the minister Keying, a relation of the emperor, the aid of English engineers in an emergency where science could scarcely fail of beneficial results; but he shook his head, and said he dared not even mention the subject.

The personal observations of M. Huc settle the question as to the real nature and amount of what is called the "Great Wall" towards the west:—

We had occasion (he says) to cross it at more than fifteen different points, and several times we travelled for whole days in the line of its direction, and kept it constantly in view. Often, in lieu of those double turreted walls, which exist near Peking, we met with

my and polyandry. The Nair, we suspect, does not limit himself to his coparcenary wife; and in the Mahabarat, although Draupadi is the wife of the Five Pândus brothers, some of them—if not all—and Arjuna especially, have several other wives. But, in case M. Huc found polyandry at Lhassa, in either form, the omission is unaccountable. It must have been as great a novelty to a European, as the rumor of Mr. Hodgson's "live unicorn."

nothing more than a simple piece of masonry, and sometimes a modest rampart of earth. We even occasionally saw their famous wall reduced to its most simple expression, and composed solely of some heaped stones.*

It may be observed, with reference to the land frontiers of the Chinese empire on the west, that the authority of the emperor, instead of abruptly encountering the hard outline of an entirely independent authority, is shadowed off by something of a blended jurisdiction. "There exists in the *Kan-sou*, and upon the frontiers of the province of *Sse-Tchouan*, many tribes who thus govern themselves, under special laws. All bear the denomination of *Tou-sse*, to which is added the family name of their chief or sovereign." (P. 36.) We find in another place that this prevails to the south-west, on the borders of *Ava*. "On the outskirts of the empire, towards the west, are a number of towns or stations, called *Tou-sse*, or 'native jurisdictions,' where the aborigines are more or less independent, and where there is, in fact, a kind of divided authority, each party being immediately subject to its own chiefs. This is particularly true of the *Lolos*."—*The Chinese*, vol. i.

It is an odd result of our war with China, that something of the same principle should have been established by treaty at the Five Ports of trade on the opposite side of the empire. British subjects are there entirely independent of the Chinese law, and governed by their own consuls, who act under ordinances framed by the governor and legislative council of Hong-kong, confirmed by her majesty in council. The inference from the frequency of these "native jurisdictions" is, that Chinese law, as administered towards foreigners, becomes intolerable; so at least it proved at Canton.

It would be a pity to spoil the following passage by a translation:—

Notre aubergiste, un Chinois pur-sang, pour nous donner une preuve de sa sagacité, nous demanda sans tergiverser si nous n'étions pas Anglais; et pour ne laisser aucun doute à sa question, il ajouta qu'il entendait par *Ing-kie-li* les "diables marins," qui faisaient la guerre à Canton. Non, nous ne sommes pas Anglais; nous autres, nous ne sommes diables d'aucune façon, ni de mer, ni de terre. Un désœuvré vint fort à propos détruire le mauvais effet de cette interpellation intempestive.—Toi, dit-il à l'aubergiste, tu ne sais pas regarder les figures des hommes. Comment oses-tu prétendre que ces gens là sont des *Yang-kouei-tse*? Est-ce que tu ne sais pas que ceux-ci ont les yeux tout bleus, et les cheveux tout rouges?—C'est juste, dit l'aubergiste, je n'avais pas bien réfléchi.—Non, certainement, ajoutâmes-nous, tu n'avais pas bien réfléchi. Crois-tu que des monstres marins pourraient, comme nous, vivre sur terre, et seraient capables d'aller à cheval?—Oh, c'est juste, c'est bien cela; les *Ing-kie-li*, dit-on, n'osent jamais quitter la mer; aussitôt qu'ils montent à terre, ils tremblent et meurent comme les poissons qu'on met hors de l'eau. On parla beaucoup des mœurs et du caractère des diables marins, et d'après tout ce qui en fut dit, il demeura démontré que nous n'étions pas du tout de la même race.

[Our inn-keeper, a full-blooded Chinese, in order

* Père Gerbillon informs us, that beyond the Yellow River, to its western extremity, (or for full one half of its total length,) the wall is chiefly a mound of earth or gravel, about fifteen feet in height, with only occasional towers of brick. Marco Polo's silence concerning it may therefore be accounted for on the supposition that, having seen only this imperfect portion, he did not deem it an object of sufficient curiosity to deserve particular notice, without the necessity of imagining that he entered China to the south of the great barrier.—*The Chinese*, vol. i.

to give us a proof of his sagacity, called upon us to say without hesitation whether we were not English: and, to leave no doubt of the meaning of his question, he added, that by *Ing-kie-li*, he meant the "sea-devils" who had made war on Canton.—"No, we are not English; and not devils of any kind, whether of the sea or of the earth." An idler came up, very luckily, just in time to remove the ill effect of this tempestuous examination: "You," said he to the inn-keeper, "do not know how to look at the human form. How dare you pretend that these people are *Yang-kouei-tse*? Don't you know that they have all blue eyes and red hair?"—"You are right," said the inn-keeper, "I had not considered it well."—"No, certainly," added we, "you have not. Do you think that marine monsters could live upon land as we do, and ride on horseback?"—"Oh, that's right, it is just so; the *Ing-kie-li*, they say, never dare to quit the sea; as soon as they get on land they tremble and die, like fish taken out of water."—They talked much of the manners and character of sea-devils, and after all was said, it was settled that we were not at all of the same race.]

These volumes contain the most detailed and complete account of Lamanism that we remember ever to have met with; and they confirm, on the authority of these Romish priests themselves, the astonishing resemblance that exists between the external rites and institutions of Buddhism and those of the Church of Rome. Besides celibacy, fasting, and prayers for the dead, there are enshrined relics, holy water, incense, candles in broad day, rosaries of beads counted in praying, worship of saints, processions, and a monastic habit resembling that of the mendicant orders. Although our worthy missionaries call the images of Lamanism *idols*, and the Romish idols *images*, we do not think the distinction is worth much, and therefore may throw in this item with the rest; the more especially as, on the summary principle of "*inveniam viam, aut faciam*," the commandment against idol worship has been thrust bodily out of their Decalogue by the Romanists, as may be seen from any copy of the Missal. It is remarkable that these very missionaries had an image made for their own adoration, from a European model, at a place on their journey where a huge image of Buddha had just been cast, and sent off to Lhasa. (Vol. i., p. 41.) Thus the object of their worship was a molten image, the work, not only of men's, but pagan hands, employed indifferently for either Buddhism or Romanism.

It is at once curious, and an instructive lesson to unprejudiced minds, to observe that M. Huc, while he indulges in pleasantries at the expense of the Buddhists, entirely forgets how applicable his sarcasms are to his own side of the question. After describing an assembly in a college of Lamas, where the explanations given by the priests or professors on certain points of their religion proved as vague and incomprehensible as the thing to be explained, he adds, "On est, du reste, convaincu que la sublimité d'une doctrine est en raison directe de son obscurité et de son impénétrabilité." Let us only suppose M. Huc expounding to those Lamas the dogma of Transubstantiation, and adding, in testimony of its truth, that St. Ignatius Loyola, with eyesight sharpened by faith, declared he actually *saw* the farinaceous substance changing itself into flesh. "Les hommes," observes our author in another place, "sont partout les mêmes!"

The jokes in which M. Huc indulges, against the devotees and recluses of Buddhism, are similar to what have been repeated a thousand times with reference to those of Romanism:—

This young Lama of eighty years old was a large well made fellow, whose lumbering and stout figure seemed to prove a great consumption of butter, in his strict seclusion. We could never see him put his nose out of his house door, without thinking of La Fontaine's rat, who, out of devotion, had retired into a Dutch cheese.

The monasteries of the Lamas, resembling as they do in so many respects those of the Romanists, differ from them on some few points. The members are all subject to the same rule and the same discipline; but they do not seem to live to the same extent in community; and exclusive rights of property prevail among them. Our missionaries passed some months in these establishments. Besides his holiness, the Supreme Lama at Lhassa, there are Grand Lamas, who derive their investiture from him, and descend from past ages in uninterrupted succession. With reference to one of these, it is observed:—

If the person of the Grand Lama drew little of our admiration, it was not so with his dress, which was exactly that of bishops: he wore on his head a yellow mitre; a long staff in form of a crosier was in his right hand; and his shoulders were covered with a mantle of violet taffety, held over his breast by a clasp, and in everything resembling a cope. Afterwards we noticed many resemblances between the Catholic worship and the ceremonies of the Lamans.

M. Huc afterwards recapitulates as follows:—

The cross, the mitre, the dalmatic, the cope or charubie which the Grand Lamas wear in travelling, or when they perform some ceremony outside the temple, the service of two choirs, the psalmody, the exorcisms, the censor supported by five chains, opened or shut at pleasure; the benedictions given by the Lamas with the right hand stretched over the heads of the faithful; the chaplet; the celibacy of the clergy; the spiritual retreats; the worship of saints; fasts; processions; litany; holy water;—see, in how many ways the Buddhists agree with us!

He might have added, that they likewise have a goddess, whom they call *Tien-how*, literally *regina cæli*, "Queen of Heaven;" but with a different legend.

Our author very naturally endeavors to persuade himself and his readers that by some process of diablerie these things have been borrowed from his own church; but why should we do such violence to the subject, when there is the much easier, more intelligible, and more straightforward course of deriving both from something older than either; and remaining persuaded, as most of us must have been long ago, that the Pagan rites and Pontifex Maximus of the modern Rome represent, in outward fashion, the paganism and Pontifex Maximus of the ancient! Strange to say, instead of blinking the matter, a sort of parallel has often been studiously preserved and paraded, as when the Pantheon, the temple of "all the gods," was consecrated by Pope Boniface to "all the saints." Is it necessary for us to compare the annual sprinkling of horses with holy water to the like process at the Circensian games—the costly gifts at Loretto to the like gifts at Delphi—the nuns to the *virgines sanctæ* of old Rome—the shrines of "Maria in trivitiis" to the like rural shrines of more ancient idols—the flagellants (whose self-discipline Sancho so dexterously mitigated in his own case) to the practices of the priests of Isis! In running the parallel, the only difficulty is where to stop. It is impossible to look at the innumerable votive

pictures and tablets which conceal, without adorning, the walls and pillars of many a church at Rome, and not to think of

nam posse mederi
Picta docet templis multa tabella tuis.

To instance a higher department of art—as the old artist, in painting his Venus, is said to have combined "each look that charm'd him in the fair of Greece," so the Italian painters have sometimes immortalized the features of their own mistresses in pictures of saints and martyrs, intended to adorn churches.

In its modern traits, as well as in its ancient, Lamanism maintains its resemblance to Romanism. Prodiges and miracles of constant occurrence come to the aid of the priesthood, and maintain their influence over the stupid multitude. Some of the instances adduced are palpable cases of ingenious jugglery; but M. Huc, with characteristic facility, believes in the miracle, while he attributes it to the agency of the devil:—

A purely human philosopher would reject, without doubt, such facts, or without hesitation would set them down as Laman tricks. As for us, Catholic missionaries, we believe that the great liar, who deceived our first parents in Paradise, still carries on his system of lies; he who had the power of supporting in the air Simon the sorcerer, may very likely now speak to man by the mouth of a child, to strengthen the faith of his worshippers.

Whatever Protestants may think and say of the means by which the Romish Church has maintained and extended its influence over the masses of mankind, it is impossible to deny the thorough knowledge of human nature on which all its measures have been calculated. The same causes which have aided it so long against the reforms of a purer faith are likely to aid it much longer; and we really see very little chance of a change. The priestly array, the lighted taper, and the histrionic pantomime, are aided by smoking censers, graven images, and all the paraphernalia by which so many temples of so many different religions have been before distinguished. We entirely agree with M. Huc, that the Romish Church has a fair field for proselytism in the vast regions where Buddhism at present prevails. In external forms, the transition is the easiest possible; and during his short residence at Lhassa, he remarked:—"Il nous semblerait toujours que la beauté de nos cérémonies eût agi puissamment sur ce peuple, si avide de tout ce qui tient au culte extérieur."*

* In a book which had belonged to a Romish missionary in China was found this estimate written on the fly-leaf in Italian:—

"Numbers included under different known religions—

Catholic Apostolic Church of Rome, -	139,000,000
Schismatic Greek Church, - - - - -	62,000,000
Protestant Church and its branches, - -	59,000,000

Total of Christianity, - - - - -	260,000,000
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Jews, - - - - -	4,000,000
Mahometans, - - - - -	96,000,000
Hindoos, - - - - -	60,000,000
Buddhists, - - - - -	170,000,000
Confucianists and others, - - - - -	147,000,000

737,000,000

"The number of Buddhists is probably not over-rated, considering that they extend from Japan to Lhassa, and from the confines of Siberia to Siam."

If the new system cannot be made to supersede the old, it may at least be grafted upon it, as experience has already proved at our own colony of Ceylon; for Romanism has sometimes been satisfied with a part, where the whole was unattainable. In a recent work by Sir Emerson Tennent, he observes of the early converts in that island to the Romish Church, "There is no reason to doubt that, along with the profession of the new faith, the majority of them, like the Singalese of the present day, cherished, with still closer attachment, the superstitions of Buddhism;" and he attributes the ease of their external conversion to "the attractions of a religion which, in point of pomp and magnificence, surpassed, *without materially differing from*, the pageantry and processions with which they were accustomed to celebrate the festivals of their own national worship." We may, however, charitably and reasonably suppose that the present emissaries of Rome would stop short of the complaisant conformity of their Jesuit predecessors, who, according to the Abbé Dubois, "conducted the images of the Virgin and Saviour on triumphal cars, imitated from the orgies of *Jagernath*, and introduced the dancers of the Brahminical rites into the ceremonial of the church."

After eighteen months of mingled residence and journeyings through the immense tract which intervenes between the neighborhood of Peking and Lhasa, MM. Huc and Gabet reached the capital of Thibet in a very weary and exhausted state. The snowy range of mountains which formed the latter portion of their route was passed with a caravan, which is periodically collected as a protection against robbers; and the miseries and privations which they endured had well-nigh proved fatal to M. Gabet, though both travellers were in the prime of life—one thirty-two, and the other only thirty-seven. Scarcely settled in the lodging where they had installed themselves, when troubles not less harassing, though of another kind, were to be encountered. "Après les peines physiques, c'était le tour des souffrances morales." As far as rested with the native government of the country, they might long have remained unmolested to exercise their zeal at the head-quarters of Buddhism; but obstacles arose in a direction which they were hardly prepared to anticipate. The minister of the Emperor of China resides at the Court of the Supreme Lama, something like the Austrian ambassador at Rome, but with a vastly greater and more undivided influence. His spies were the first to detect the intruders; and he succeeded, at length, notwithstanding the favor and kindness shown to them by the temporal Regent of Thibet, in effecting their expulsion from the country. The whole narrative is extremely curious, and, in fact, gives a better insight into the real relations existing between Peking and Lhasa than any other source within our reach.

In addition to the numerous and striking analogies which have been traced between the rites of Lamanism and the Roman worship, M. Huc observes that "Rome and Lhasa, the Pope and the Supreme Lama, might also furnish points of resemblance full of interest." The Thibetian government is altogether ecclesiastical. The Talé or Dalé-Lama is its political and religious head. When he dies, or, as the Buddhists say, transmigrates, his indestructible personification is continued in a child, chosen by the great Lamas, distinguished as *Houtouktou*, whose sacerdotal rank is inferior only to that of the Grand Lama, and

whom, therefore, we may compare to the Cardinals. The present Dalé-Lama is only nine years of age, and his three predecessors had none of them reached their majority; a circumstance which seems to indicate foul play, and which was, in fact, expressly attributed to treachery on the part of the administration of Thibet, vested chiefly in the hands of a functionary styled Nomekhan, during the Grand Lama's minority.

A party at Lhasa opposed to this Nomekhan applied secretly, in the year 1844, for the interference of the Emperor of China, who is sufficiently ready to extend his influence, on all occasions, in Thibet and elsewhere. The person selected to proceed as ambassador to Thibet, and overturn the ill-acquired power of the Nomekhan was Ke-shen, who only about four years before had been ruined by the result of his negotiations at Canton; but whose energy and talents appear still to have been appreciated by the emperor's government, and whose failure might possibly have met with palliation and excuse in the still worse failures of his successors in the south. On reaching Lhasa, Ke-shen took his measures in concert with those opposed to the Nomekhan. That high functionary was arrested; when, to avoid torture, he at length confessed to the guilt of having taken *three lives* from the Grand Lama, or, in other words, having caused his transmigration three times by violence. To this confession the seals of Ke-shen and the other parties were affixed, and it was transmitted by a special courier to Peking.

Three months afterwards the capital of Thibet was frightfully agitated; at the door of the palace of Nomekhan, and in the principal streets of the city, was placarded an imperial edict, in three languages, on yellow paper, and with borders representing winged dragons. After lofty reflections upon the duties of kings, and of sovereigns great or small;—after exhortations to potentates, monarchs, princes, magistrates, and the people of the four seas to walk in the paths of justice and virtue, under pain of incurring the wrath of Heaven, and the anger of the great Khan—the emperor recalled the crimes of Nomekhan, and condemned him to perpetual banishment to the shores of Sakhalien-oula, at the extremity of Manchouria.—At the end, was the usual form—tremble and obey.

Such an unusual sight as this Imperial Edict on the gates of their governor excited a general insurrection among the Thibetians of Lhasa. At half a league's distance is a College of Lamas, composed of some thousands. These armed themselves at random, and came down like an avalanche, denouncing death to Ke-shen and the Chinese. They carried by assault the residence of the ambassador, who, however, was not to be found. They next attacked those who had acted with him, and sacrificed more than one to their fury. They released the condemned Nomekhan, who, however, had not the spirit to avail himself of the occasion. "He had," says M. Huc, "the cowardly energy of an assassin, and not the boldness of a conspirator."

The next morning, the Lamas were again agitated like a hive of bees, and again swarmed down upon Lhasa. But Ke-shen had profited by the interval, and his measures were taken. A formidable array of Chinese and Thibetian troops barred their passage; and the Lamas, whose trade was not fighting, betook themselves to their cells and their books, and were glad to avoid the consequences of their temerity in an immediate resumption of their clerical character. In a few days, the Nomekhan, who had thrown away his only chance,

was on his way "comme un mouton" to Tartary—while Ke-shen, elated with his triumph, showed a disposition to extend the penalties to his reputed accomplices in guilt. The ministers of the local government, however, thought the Chinese influence had done enough, and the ambassador had the prudence to forbear. The new Nomekhan was selected from the Lamas of the greatest eminence in the country; but as the choice fell on a youth of only eighteen, a regent was appointed in the person of the chief kalon, or minister. This individual soon showed that his first care was to provide barriers against the ambition and encroachments of the Chinese ambassador, who had so boldly taken advantage of the weakness of the Thibetian government, to usurp its powers, and extend the pretensions of his master, the emperor.

Things were in this state on the arrival of our two missionaries, who, after some weeks of unmolested residence, began to flatter themselves that they might pass unobserved. They were one day seated at their lodging in conversation with a Lama well versed in Buddhistic learning, when a well-dressed Chinese suddenly made his appearance, and expressed a strong desire to inspect any merchandise they might have to dispose of. They in vain declared they were not merchants; he was not satisfied, and in the midst of the discussion arrived a second Chinese, and then a third; after which, the number of visitors was soon swelled to five, by the appearance of two Lamas in rich silk scarfs. They all joined in a multitude of questions, addressed to MM. Gabet and Huc, and their looks were directed on all sides, in a minute examination of the contents of the dwelling. They at length took their leave, promising to return, and left our missionaries in an uncomfortable state, justly thinking that the pretended chance visit looked like a concerted measure, and that their new friends had very much the appearance of either spies or swindlers.

When dinner was over, two out of the late five reappeared, and at once announced that the regent desired to see the missionaries:—"and that young man," said they, pointing to their faithful Tartar attendant, *Samdachienba*, who eyed them with no very friendly looks—"he must come too." The authorities must be obeyed, and they set out together towards the palace of the regent. On their arrival, they were conducted through a court and passages, crowded with Thibetians and Chinese, to a large room, at the end of which was seated the regent, with his legs crossed upon a thick cushion covered with a tiger's skin. He was a man of about fifty, stout, and remarkably fair, with a most intelligent and benevolent countenance. The strangers were invited to seat themselves on a bench covered with red carpet to their right.

As soon as we were seated, the regent considered us a long time in silence, and with minute attention. He leaned his head sometimes to the right and sometimes to the left, and examined us in a manner half mocking and half good-natured. This sort of pantomime seemed to us at last so droll, that we could not help laughing. "Well," said we in French, in a low tone, "this gentleman seems a pretty good fellow; our business will go well."—"Ah!" said the regent, with a voice full of affability, "what language do you speak? I did not understand what you said."—"We speak the language of our country."—"We shall see. Repeat aloud what you just said in a low voice."—"We said, This gentleman seems a pretty good fel-

low."—"Do the rest of you," said he, turning to those standing round him, "understand this language?" They bowed all together, and said they did not understand it. "You see, nobody here understands your language; translate your words into that of Thibet."—"We said that in the physiognomy of the chief kalon there is much goodness."—"Ah, yes; you find me very good? Nevertheless, I am very wicked. Am I not very wicked?" he asked his people. They smiled, and did not speak. "You are right," continued the regent; "I am good, for goodness is the duty of a kalon. I ought to be good to my own people, and also to foreigners."

The good-natured functionary assured the missionaries that he had sent for them merely in consequence of the contradictory reports in circulation, and without the least wish to molest them. After having found, to his surprise, that they could express themselves in the written characters of China, Tartary, and Thibet, and having satisfied himself as to the nature of their pursuits, he informed them that the Chinese resident was himself going to question them. He advised that they should frankly state their history, and added, that they might depend upon his protection, for it was himself who governed the country. As he took his departure, the noise of the gong announced the approach of Ke-shen. The experience of our travellers made them anticipate a less agreeable interview in this quarter; but they screwed their courage up to the sticking place, determined that as Christians, as missionaries, and as Frenchmen, they would not kneel to anybody; and they bade their squire and neophyte, *Samdachienba*, confess his faith, if the occasion should require. The portrait of the celebrated mandarin must be given at full length.

Ke-shen, although sixty years of age, seemed to us full of strength and vigor. His face is undoubtedly the noblest, most gracious, and most intellectual, that we had ever seen among the Chinese. As soon as we had taken off our hat to him, making a bow to him in our best possible fashion, "That's right," said he, "follow your own customs. I have heard that you speak the language of Pekin correctly. I wish to converse with you for a moment."—"We make many mistakes in speaking, but your wonderful intelligence will be able to make up for the obscurity of our words."—"Why, this is pure Pekin indeed! You French have a great facility for all sciences. You are French, are you not?"—"Yes, we are French."—"Oh! I know the French; formerly there were many of them at Pekin. I saw some of them."—"You should have known some of them also at Canton, when you were imperial commissioner." This souvenir made our judge knit his brow; he drew out of his repository a large pinch of snuff,* and snuffed it up in very bad humor. "Yes, it's true. I have seen many Europeans at Canton. You are of the religion of the Lord of heaven, are you not?"—"Certainly; we are even preachers of that religion."—"I know it, I know it. No doubt you have come here to preach that religion?"—"For that very purpose."—"Have you already gone over many countries?"—"We have gone through all China, all Tartary, and now you see us in the capital of Thibet."—"With whom did you lodge when you were in China?"—"We do not answer questions of that nature."—"But if I command you?"—"We could not obey." (Here the displeased

* The Chinese generally take snuff out of a small bottle, but Ke-shen probably required larger supplies, and had a silver box or vessel at his side—"vase en argent."

judge struck his fist hard on the table.) "You know," we said to him, "that Christians are not afraid; why, then, try to intimidate us?"—"Where did you learn Chinese?"—"In China."—"In what part?"—"A little everywhere."—"And the Tartar language, do you know that?"—"Where did you learn it?"—"In Mongolia, the land of herbs."

The firm bearing of MM. Hue and Gabet was properly respected by Ke-shen, who, however, did not treat with the same ceremony their Tartar attendant, *Samdachiemba*, on finding he was a subject of China. He ordered him peremptorily to kneel, and in that attitude obtained from him his history, which might have gone far to compromise the unfortunate squire, but for his connection with the two missionaries. Ke-shen's character appears to considerable advantage throughout this narrative. Encroaching and overbearing towards the Thibetian government, according to his supposed duty to his sovereign, his personal demeanor to the two travellers proved his due appreciation of the European character, no doubt the result of his experience at Canton. The lateness of the hour put an end to the audience, and our missionaries had an immediate interview, followed by a supper, with their kind friend, the regent, whose solicitude may fairly be attributed as much to his jealousy of the Chinese resident, as his sympathy for the strangers. At this interview appeared as interpreter, on account of his knowledge of the Chinese language, (the medium most familiar to the missionaries,) a certain Mahomedan chief of the Mussulmans of *Cashmere*, resident at Lhasa. This little incident shows our increased vicinity to the Chinese empire, since Gholab Singh, ruler of Cashmere, became our tributary, and bound himself in the treaty with Lord Hardinge, to transmit annually a dozen fine shawls, and a certain number of shawl goats, in acknowledgment of British supremacy.

The greatest cause of anxiety to the regent, and the circumstance most likely to compromise the missionaries, proved to be the supposed possession of maps of the country, constructed by themselves. It would seem, according to our author, that this fear originated since the visit of our countryman Moorcroft,* who, according to the Thibetians, introduced himself at Lhasa as a native of Cashmere. They stated that, after a residence of some years, he took his departure, but was murdered on his way to Ladak. Among his effects were a number of maps and designs, which he had executed during his stay in this country; and hence the fear of map-makers. The truth, however, is that this fear has been of long standing, in China at least, where the common notion of an Englishman is that of a *bipes implumis* who goes about making maps of the country, with an express view to future conquest. Keying, the most liberal Chinese we have ever had to deal with, was in a perpetual fidget about the coast survey, carried on, since the peace, by that able officer Captain Collinson, between Hong-Kong and Shanghai, and plagued H. M. plenipotentiary incessantly on the subject. It was

useless to protest that nothing but the safety of our traders was in view; that the commercial treaty was altogether futile without the safe navigation of the seas by our merchant vessels; and it became necessary at once to cut the matter short by saying that the commanders of H. M. ships must obey any orders they received from their government in the prosecution of their lawful business.

Maps of the country our missionaries had, but they were not autograph, nor even manuscript. A grand scrutiny took place before Ke-shen.

"We are fortunate," said the travellers to the Chinese minister, "to find you here. In your absence it might have been impossible to convince the authorities of Thibet that we did not construct these maps ourselves; but to a person of your information—to one so well acquainted with European matters—it is easy to perceive that these maps are not our work." Ke-shen appeared greatly flattered by the compliment. "It is evident at once," said he, "that these are printed maps. Look," he added to the regent, "the maps, instead of being made by these persons, were printed in the country of France. You could not perceive that; but I have been long accustomed to distinguish the various objects which come from the West."

Solventur risu tabule.—This incident was of more use to the missionaries, and relieved them more completely from the cloud which had hung over them, than anything else that could have occurred. The only fear and anxiety of the regent himself was effectually removed, and from being virtually prisoners, and their baggage under seal, they returned in a sort of ovation to their lodging. It did not seem unreasonable for them, under all the circumstances, to hope that they might remain unmolested in the country. This appeared still more probable after their friend, the regent, had allowed them to take up their quarters in a house belonging to the government, where they established a chapel, and where they were visited by both Thibetians and Chinese, some of whom manifested no disinclination towards the Romish worship. Enough has been shown to prove that, in external rites, there is not a great deal of difference, and there are, besides, certain circumstances which give the Papal emissaries great practical advantages over Protestant missionaries. Whatever may be the evils or scandals attending celibacy in the Romish Church, (and Dr. Dens' mis-called "Theology" proves its dangers in the confessional,) it has been very useful to them in the case of foreign missions, and in the exploration of untried regions or new fields of action. The very undertaking we are considering could never have been accomplished by Protestant clergymen encumbered with the "impedimenta" of wives and families. When a missionary is nominated from England, the prospect of a provision, supposing him to be single, generally induces him to marry, and he fixes himself down, say at one of the five ports of China, for perhaps his life, with the very moderate prospect of converting the empire from a place corresponding to one of our seaports. If he dies prematurely, which is often the case, the funds which sent him out become charged with the maintenance of those whom he leaves behind, and we need only look over the accounts of the Propagation Society to see that a very considerable amount of their funds (most justly and unavoidably we admit) are swallowed up annually in this way.

The interval of prosperity now enjoyed by our travellers, but destined to be too soon interrupted,

*The time and place of Moorcroft's death near Balkh, as related by Professor Wilson, have been confirmed through repeated notices gathered by Barnes and others during our occupation of Cabul and the adjacent countries, and there is no doubt of the fact. Moorcroft's residence for twelve years, from 1826 to 1838, at Lhasa, without being heard of, directly or indirectly, by any European, whether in India, Nepal, China, or Russia, is incredible on the face of it.

was varied by some interesting and unreserved conversations with Ke-shen. His Canton recollections seemed to haunt him. Ke-shen asked us for news of Palmerston; if he was still minister of foreign affairs. He gave them a graphic and perfectly true description of the absolute power of the Chinese sovereign:—

Our emperor says to us, "You see that is white." We prostrate ourselves, and answer, "Yes, it is white." Then he shows us the same thing, and says, "You see that is black." We prostrate ourselves again, and say, "Yes, it is black." But if you were to say that a thing could not at the same time be both black and white, the emperor would say perhaps to him who had that boldness, "You are right"—but at the same time he would cause him to be strangled or beheaded.

Ke-shen was a high authority on this subject, for he had been one of the emperor's privy councillors.

M. Huc persuades himself, naturally enough perhaps, that the Chinese resident at Lhasa became jealous of the progress made by himself and M. Gabet among the Thibetians, and therefore determined on bringing about their departure from the country; but any Chinese functionary in his position would have deemed such a measure necessary, and a mere act of prudence as concerned himself, considering he served a master who, as we have just seen, treats his servants in so truculent a style, even when they have reason on their side. Ke-shen had already been once condemned to death himself.

One day the ambassador, Ke-shen, had us called, and, after much cajolery, he ended by telling us that Thibet was a cold country, too poor for us, and that we must think about going back to France. He said this with a kind of careless frankness, as if he had supposed that no objection could be made to it. We asked him whether in thus speaking he intended to give us advice or commands?—"Both," said he coldly.

They in vain urged that they were not Chinese subjects, and therefore disclaimed his assumed authority over them in Thibet. The conference was abruptly terminated by their being informed that they must prepare themselves to quit the country. They went at once to their friend, the regent, who, in words at least, seemed to impress them with the notion that he did not consider their departure absolutely depended on the will of the Chinese Resident. The habitual insincerity of Asiatics renders them very ready to say anything that may be agreeable to their hearers, and their love of ease makes them willing to avoid unpleasant discussions. It is very probable that the regent was jealous of Ke-shen; but we cannot go quite the length of imagining, with M. Huc, that a ready compliance with the determination of Ke-shen on the part of himself and M. Gabet became necessary, "de peur de compromettre le regent, et de devenir, peut-être, la cause de fâcheuses dissensions entre la Chine et le Thibet." We are persuaded that, whatever circumstances may occur to occasion a war between Thibet and China, it will not be for such a cause as this. M. Huc must before now have become sensible that he equally miscalculated in another quarter. "Dans notre candeur, nous nous imaginions que le gouvernement français ne verrait pas avec indifférence cette prétension inouïe de la Chine, qui ose poursuivre de ses outrages le Christianisme et le nom français jusque chez les peuples étrangers, et à plus de mille lieues loin de Peking."

China has long exercised the same sort of power or influence in countries very far west of Lhasa, and therefore more distant from Peking.

It was certainly a stipulation in 1845, between M. de Lagrené, the French minister, and Keying, that the Romish religion should no longer be subject to persecution in China; and Sir John Davis lost no time in obtaining for Protestants whatever privileges were to be accorded to Romanists. In 1847, however, two Romish bishops, *in partibus*, were found in the interior, and immediately sent off to the coast, whence they found their way to Hong-Kong, indignant at what seemed to them so direct a violation of treaties. The Chinese government declared that the privileges in question were only intended for the Five Ports where Europeans were permitted to reside, and that they did not extend to admitting the teachers of Christianity into the interior.

We altogether concur with M. Huc on one point. If the two missionaries were to quit Lhasa, they might at least have been allowed to leave it in the readiest and easiest way. Within three weeks' journey was the frontier of Bengal, whence it was their wish to proceed to Calcutta. But no; Chinese fears and jealousies had decreed otherwise. The same absurd precaution which had caused certain emissaries from Russia to be conducted by a roundabout course from Kiachta to Peking, doomed our poor missionaries to *travail* from Lhasa through alpine passes to the frontier of China, and from thence to Canton—a weary course of about eight months. They protested in vain, and declared they would denounce this cruel measure to the French government. Ke-shen was inflexible, observing that he must remember what was expected from him by the emperor, and take care of his own head.

A good escort, however, was provided, and every care taken for the welfare of our travellers. A mandarin of respectable military rank, and fifteen Chinese soldiers, were charged with their safe conduct by Ke-shen in person, who, moreover, in a most edifying oration, recorded by M. Huc, pointed out their respective duties; and truly the undertaking before them was not a light one, as the description of the journey to the Chinese frontier (where the present work concludes) will easily show. In this almost impassable tract of country we may discover the real cause of the separation, for so many ages, of China from the Western world; for mountains of nearly the same alpine character extend all the way from Tartary southwards to Yunnan and the frontiers of the Burmese empire. The hardships of the present journey, undertaken under all possible advantages, killed no less than three mandarins, that is, their conductor and two others who joined them on the route. We must observe, however, that the former had been invalidated from his duties on account of swelled legs and other, probably dropsical, symptoms, brought on by the abuse of stimulating liquors. We must give our author's description of this mandarin's separation from his Thibetian wife, as it is a specimen of M. Huc's style:—

Avant de monter à cheval, une Thibétaine vigoureusement membrée et assez proprement vêtue se presenta; c'était la femme de Ly-kouo-ngan. Il l'avait épousée depuis six ans, et il allait l'abandonner pour toujours. Ces deux conjugués moitié ne devant plus se revoir, il était bien juste qu'au moment d'une si déchirante séparation, il y eut quelques mots d'adieu. La chose se fit en publique, et de la manière suivante. —Voilà que nous partons, dit le mari; toi, demeure

ici, assise en paix dans sa chambre.—Va-t-en tout doucement, répondit l'épouse; va-t-en tout doucement, et prends bien garde aux enflures de tes jambes. Elle mit ensuite une main devant ses yeux, comme pour faire croire qu'elle pleurait.—Tiens, dit le Pacificateur des royaumes* en se tournant vers nous; elles sont drôles ces femmes Thibétaines; je lui laisse une maison solidement bâtie, et puis une foule de meubles presque tout neufs, et voilà qu'elle s'avise de pleurer! Est-ce qu'elle n'est pas contente comme cela.—Après ces adieux si pleins d'onction et de tendresse, tout le monde monta à cheval.

[Before getting on horseback, a stout, well-made Thibetian woman, well dressed, made her appearance. It was the wife of Ly-kouo-ngan. They had been married six years, and he was going to leave her forever. These conjugal halves, not being to see each other again, it was proper that at such an excruciating separation, they should have some words of farewell. The affair came off in public, and in this manner. "We are going to set off," said the husband; "do thou remain here, and sit quietly in thy chamber."—"Go carefully," answered the wife, "and take care of the swellings of your legs." She then put one hand before her eyes, as if to pretend that she wept. "Just see," said the husband, turning to us, "how queer these Thibetian women are! I leave her a well-built house, besides a quantity of furniture nearly new—and yet she is going to cry! Is she not satisfied with that?" After these adieux, so full of soul and tenderness, we all mounted our horses.]

One word more about Ke-shen. A most striking trait of Chinese character is recorded by M. Hue, just as he is on the point of departure. We have seen the circumstances under which our missionaries took leave of the imperial representative at Lhassa. Whatever he might think or say on the occasion, *they*, at least, had just cause to consider themselves treated by him with unnecessary harshness; if not for their removal from Thibet, at least for their removal by the way of China, instead of Bengal. Notwithstanding all this, he drew them aside at their last interview, and said confidentially: "I shall soon be on my way to China myself; that I may not be overcharged with effects on my departure, I send two large chests by this opportunity; they are covered with Thibet cow skins (showing us at the same time how they were lettered); I recommend these two cases to your special care. When you reach the relays at night, let them be deposited in your sleeping apartment; and when you arrive at the capital of *Sse-chuen* province, deliver them to the care of the viceroy." Thus, when a Chinese officer, a countryman and nominee of his own, was going the same journey, he preferred entrusting this treasure (for such no doubt it was) to two poor European missionaries, whom he had injured, rather than to a Chinese mandarin of respectable station, who was, in a great measure, his own dependant. He had often said that he admired and respected the European probity, and this was a practical proof of it. M. Hue very justly adds: "This mark of confidence gave us pleasure: it was a compliment to the honesty of Christians, and at the same time a bitter satire upon the Chinese character."

Some time after Ke-shen's disgrace, there appeared at Hong-Kong the copy of a Peking gazette, which detailed the circumstances of his sentence, and gave the amount of his registered property. The two ministers commissioned on the occasion

* A play on his Chinese name.

† The Yak of Thibet, *bœuf à long poil*, figured in Turner's embassy.

reported that they found in his house, or at least his possession, 682 Chinese pounds of gold, being about 14,560 English ounces; but of silver the enormous amount was 17,940,000 taels, which is more than six millions sterling, or as nearly as possible the whole amount of indemnity paid to England on account of the war, including the ransom of Canton. Ke-shen might thus truly be said to have "paid for the war." But, as if this were not enough, his women were sold by auction (Mr. Robins never had such an opportunity), and when he reached the capital from Canton, he was without the necessities of life, though the emperor soon packed him off to Elee, the Celestial Siberia.* After all this, it was rather cool, when his services were wanted, to appoint him resident at Lhassa; where, however, he soon contrived to do something towards repairing his broken fortunes, by helping himself to the gold and precious stones in which Thibet abounds. The two chests in charge of the missionaries were, no doubt, an instalment of his remittances to China; and he is now viceroy of the province of *Sse-chuen*, (whither he sent the chests,) one of the largest of the empire, being equal in area to all France. This strange history is not unlike that of many a minister of the Celestial Empire.

Our missionaries make no pretension to learning; and are credulous in proportion. But their notices of the life before them are curious, and, we believe, truthful. We will conclude with two very extraordinary Thibetian customs, which we do not remember in Turner; though it must be observed that, while they did not reach Ladak or the Indian frontier, neither did Turner reach Lhassa or the Chinese.

The Thibetian women at their toilette submit to a custom, or rather to a regulation, almost incredible. Before going out of their houses they anoint their faces with a black and sticky varnish, a good deal like preserved raisins. As their object is to make themselves ugly and hideous, they spread this nasty paint over their faces every way, and daub themselves so as no longer to look like human beings.

It is certainly something altogether new to find any race of women with the ambition "de se rendre laides et hideuses," but it must be an amazing simplification of the business of the toilet. The only wonder is that such a custom was ever submitted to, when, as M. Hue states, a certain Nomekhan, or Lama-king of the country, imposed it on the female part of the community, as a corrective of their morals and a protection to their virtue.

In order to put a stop to a licentiousness which was becoming almost general, Nomekhan published an edict, by which women were prohibited from appearing in public without daubing their faces in the manner we have described. High moral and religious considerations caused this strange law, and threatened the disobedient with severe punishments, and, above all, with the wrath of Buddha.

Nothing but a hierarchy, or rather, a nation of priests, could ever have succeeded in so monstrous a scheme of moral or religious discipline, more unnatural than the nunneries of Romanism. "One need not sure look frightful, though one's dead."

* M. Hue has the true version of the story. "The emperor, in his paternal tenderness, gave him his life, and contented himself with degrading him from all his titles, taking all his decorations from him, confiscating his goods, razing his house, selling his wives at auction, and sending him to banishment at the extremity of Tartary."

The second strange custom is a Thibetian salutation of respect, more absurd even than the "nose-rubbing" with which the Esquimaux greet their friends. M. Hue describes it by the terms "tirer la langue," which can only mean "putting out the tongue." We have read that the New Zealanders have a habit of expressing their hatred or defiance of their enemies by the same elegant gesture, and for such a purpose it might seem sufficiently significant and appropriate among savages; but how a people, at least semi-civilized, like the Thibetians, could ever have fallen upon such a mode of signifying respect, is altogether marvellous. It goes far at least to prove the purely conventional nature of all such signs, when the very *opposite* movements have been adopted by different nations to denote the same thing. If to uncover the head be, in Europe, a mark of respect, it is precisely the reverse in China; and, though to salute with either the right or left hand be a nearly indifferent matter among us, a salutation with the left is so deadly an insult with Mahomedans in the East, as to have been instantly answered with a stab or a shot. For this reason, the native commissioned officers of our Indian army, in giving the military salute, confine it to the sword held in the right hand, and do not at the same time raise the left hand to the forehead.

Since the Ruler of the Valley of Cashmere has become a tributary to the British crown, circumstances must occasionally bring us into contact with the Chinese government through Thibet. From the first conclusion of the treaty between Gholab Singh and the governor-general of India, Lord Hardinge, with the foresight of a statesman, turned his attention to the accomplishment of two most desirable objects. First, the exact ascertainment and definition of the boundaries between Cashmere and the Ladak territory; and, secondly, the continuation of the same trade between the territory, now dependent on the British government, and Ladak, as had been before established by treaty between Cashmere and Ladak. We found, in fact, such a treaty existing, by which tea* and shawl-wool were to be transmitted to Cashmere and the Punjab by the Ladak road; and persons proceeding from Ladak to China, or from China to Ladak, were not to be obstructed on the way. That no means might be left untried, Lord Hardinge engaged the services of H. M. Plenipotentiary in China, to communicate with the minister of the emperor, Keying, on the subject, and obtain, if possible, the appointment of Chinese or Thibetian commissioners to meet our own on the new frontier of India. The land distances to be traversed in negotiation were enormous. From Canton to Peking was 1200 miles, and from Peking to our frontier more than 2000. Various and Protean were the shifts and changes by which Keying, in Chinese fashion, endeavored to elude all concern or responsibility in the matter. Among others was this highly ungeographical objection: "The trading with Thibet would not be in conformity with the maritime treaty, as it is not included in the Five Ports." When convinced of the real nature of this *non-sequitur*, Keying admitted that the traders on the Indian frontier might carry on a commerce entirely distinct from that of the English merchants, who repair to the Five Ports of China; and he engaged

* Our manufactory of tea in Kumaon is so promising that we may one day supply it to Thibet and Chinese Tartary, where the consumption is very large.

"faithfully to transmit to his sovereign the whole tenor of the correspondence." He would hardly fail to do so, being aware that all Lord Hardinge's communications must at last reach Peking through Thibet, and betray any concealment of the subject. Three commissioners were appointed by Lord Hardinge, in 1847, to enter the Thibetian territory, and endeavor to settle the frontier boundaries, if possible. Other objects were combined with the principal one. Lieutenant Strachey, one of the commissioners, was instructed to follow up his previous researches in Ngari, and penetrate through Gurdokh to the Lake Manasarowar, and so eastward, as far as practicable, through Darjeling or Bhotan to the British provinces. That officer has printed an interesting narrative of his first journey, in 1846, proving the rigors of those alpine regions to be precisely corresponding to the experience of MM. Hue and Gabet; and we hope in time to have a detailed account of his more recent and official researches.

From the Spectator, 24 May.

MR. THACKERAY'S LECTURES.

WHAT are his lectures like?—good of course, exceedingly worth hearing, but like *what*?

Well, they are like his conversation, like his books, like himself; probably very near to what was expected by that audience, fit though not few, which assembled to hear the question for itself on Thursday.

We all knew before, how Thackeray handles the follies which he satirizes—with what gentleness and tenderness. If the operator enjoys, in an innocent and unconcealed pride, the skill with which he applies the keenest of edges—if he is apt to dwell somewhat disproportionately upon subjects whose infirmities or eccentricities are the most suited to his treatment—you see, by the unmistakable eloquence of his demeanor, that it is from sympathy, not malignity; that his bent in that direction has been imparted by deep suffering, and by an over-consciousness of foibles which must be shared to be felt so sharply. He knows what he is talking about. If you could mistake the confession of the most intimate knowledge, searching even to the springs and motives, or of that musical but changeable voice—changing with each phase of thought or feeling, you cannot mistake the explicit avowal. What distinguishes Thackeray from other English satirists is his knowledge of the world, his enjoyment even of the luxuries, the gaude, and the little ostentations, at which he has his fling. His inordinate admiration of power teaches him to sympathize even with servility; but all the while a masterly intellect with its keen insight, a warmly loving heart which loves best what is best, and a large piety pure from the first freshest sources of nature, teach him to worship only the noblest forms of power and protest against tyranny of every kind. He is a satirist, but *not* supercilious. It is Rousseau, but, no longer dreaming, master of himself and his subject; Swift, but informed by the insight of love; Molière, but with a steadier purpose, and the confidence of a freer time and country.

Thackeray in the rostrum is not different from the Thackeray at the table or in the printed page, except that he is in the rostrum. His lecture is a long soliloquy, giving you Thackeray's idea of his subject. Thus the first of these Thursday lectures was his idea of Swift—the sum and substance of

LOST TRAVELLER.—EMIGRATION OF FEMALE PAUPERS.

what had been suggested to the great humorist by the career of that audacious and able, that mortified and baffled, that cassocked unscrupulous adventurer, with his attainments, his brilliancy, his sorrows rendered ghastly by their concealment, his unintelligible loves, his intellectual distinction before death; the frustration of greatness for lack of love and faith. All this told with the intuition of sympathy and the vigor of a congenial mind; the kindest of satirists analyzing the harshest.

But the look and manner of the man! Thackeray in the rostrum, we say, is not different from Thackeray anywhere else; a thought graver, perchance, because he is reading, or is nervous at the idea of sustaining, himself alone, a colloquy with that distinguished assemblage. But the form which rises before you in that crimson desk is unaltered; it is the same strange, anomalous, striking aspect; the face and contour of a child—of the round-cheeked humorous boy, who presumes so saucily on being liked, and liked for his very impudence—grown large without losing its infantile roundness or simplicity; the sad grave eyes looking forth—through the spectacles that help them but baffle you with their blank dazzle—from the deepest vaults of that vast skull, over that gay, enjoying smile; the curly hair of youth, but gray with years brought before their time by trouble and thought.

Those years, rich in study, have produced the consummate artist. The highest art lies *not* in concealing the art, but in so perfecting the means that *they* work unseen and unheard, while the artist uses them to set before you Nature undistorted by his efforts to drag her forth, undistracted by accessories. The admirable execution of his work; the vigorous exclusion of surplage; the selection of the figures and scenes to fill his canvass; the truth and sufficiency of every touch; the command of chiaroscuro, in which the sombre was relieved by the brilliant, the terrible by the pathetic; the closeness, pregnancy, and elegance of diction; the delicate and masterly finish of the whole, appreciated only by the too-watchful critic—were equally relished by the most accomplished of the masculine minds in that room, the most unsophisticated of feminine hearts. Perfect art had attained its end in perfect simplicity, which obtruded nothing between the subject and the hearer; only that the hearer, endowed for the time with the faculties of the lecturer, saw with unwonted eyes and insight.

By dwelling more upon the humanities of his subject than the conventionality or costume of the time, though not forgetting that, Thackeray appeals to an interest that never passes away; with him the present company is never excepted. The follies, the servilities, the corruptions of Anne's day, are essentially the same with those of the more finished manufacture, Queen Victoria's reign. Thackeray neither conceals nor obtrudes the application of his moral; his audience neither avoids nor resents it. Society came bodily to be anatomized, as willingly as it would to undergo any other wholesome and desirable operation. If the chaster was nervous at his task, the willing patient encouraged him; and when he cut home, he did not enjoy his skill alone. For Thackeray is a satirist without arrogance—an instructor without airs of superiority—a gentleman—a companion who makes you a party to his thoughts, and in this way of life surveys the passing scene from the carriage-window with a pleasant converse that heightens every trait; while you, elevated to his

level, survey with him—enjoying the variety, laughing at the accidents, quizzing the unconscious passenger; and then remembering how that passenger has feelings, tastes, appetites like yours—commands your sympathy—deserves, if not your help, your prayers; for are we not all alike, with follies, weaknesses, powers wasted, but good still at heart, and all the better for standing by one another? At least, Thackeray says so; and we are inclined to believe his honest countenance.

THE LOST TRAVELLER.

AMONG the numerous victims, distinguished travellers, whose lives have been sacrificed to the perils of African discovery, the world has almost forgotten that of the unfortunate Jacques Compagnon, who, under the auspices of the Duke de Choiseul, left Senegal in 1758 to explore the country to the north and east of Senegambia, penetrated as far as the wooded desert of Simboni, where he was heard from in 1760, and then disappeared, never, it was supposed, to be heard from again. After ninety years of mystery and oblivion, however, the veil has been removed, and the secret of his fate has been disclosed by M. de Gaysa, a Hungarian explorer in Africa, from whom a letter has been received by the Imperial Society of Vienna, disclosing the discoveries which seem to place the fact beyond question, besides giving it a very interesting aspect. M. de Gaysa writes from the country of the Kommenis, a semi-civilized tribe, who have some religious notions "possessing a certain analogy with the Christian tradition, a regular language, an alphabet, and a mode of writing," all, or most of which, they appear, from their own account, to have derived from a stranger, a European, who died among them in 1775, and whose memory was revered as that of a sage or good genius. That this stranger was Jacques Compagnon, was proved by a number of circumstances, not the least conclusive of which was several personal relics, regarded by the people as sacred, one being a quadrant with his name engraved upon it in full. It would seem, from such accounts and traditions as M. de Gaysa was able to gather, that Compagnon was detained by the Kommenis, and, being reconciled at last to his captivity, devoted himself to instructing them in the useful arts. His tomb, consisting of "a little stone monument of a conical form, covered with an inscription in hieroglyphical characters," was pointed out to the Hungarian visitor in one of their principal villages.

EMIGRATION OF FEMALE PAUPERS.—The *Clare Journal* says:—"One hundred and fifty young females, from the workhouses of Ennis, Kilrush, and Ennistymon, embarked at the North-wall Quay, Dublin, on board the British and Irish Company's steamer, the Foyle, for Plymouth, where they are to sail, under the government auspices, for Australia. Their ages range from sixteen to five-and-twenty; and we are glad to be able to quote the following testimony as to their personal appearance from eye-witnesses of their embarkation—though it merely announces a fact well known to all who saw them here at their departure:—"A finer set of girls, for their position in life, could not be seen—healthy, ruddy, and comfortably clad—a credit to the guardians and officials of their respective unions."

Two large casks of *eau de Cologne* have arrived from the Continent, on account of the Austrian commissioners, for the Great Exhibition; the same being intended for the supply of the fountain of Cologne water, which is to be perpetually in play in the Austrian department of the Exhibition, and which, according to the arrangement, will be newly supplied to the fountain each day during the time.

From the British Quarterly Review.

1. *Johnston's Physical Atlas.* Folio.

2. *Physical Geography.* By Mrs. SOMERVILLE.

THE remarkable phenomena of which it is intended to treat in the present paper, have occurred during the whole historical period down to the present time. They afford the strongest evidence we possess of what the internal constitution of our globe is, and reveal a kind of agency which has been, and still is, one of the most powerful in modifying its external appearance.

It is worth considering how much knowledge regarding the first constitution of our planet would have been lost to us, and how many more points in its subsequent history, than at present, would have been obscure, had *active* volcanoes been unknown to us. It is not a strained hypothesis to suppose such ignorance to have really existed. For the greater part of the volcanic activity in Europe showed itself before the historical period, and in districts which have since lain entirely dormant. Had the comparatively small districts of Naples and Sicily been also extinct, like similar districts in other parts of Italy, and had we been acquainted only with the continent of Europe, the hypothesis would have been realized. The geologist would then have found the key wanting to the differences between unstratified rocks, (granite, porphyry, &c.) and the stratified series. The relative positions of these two classes of rock would have given rise to most puzzling inquiries. Many parts of Europe now interpreted to be extinct volcanic regions, would have been blanks. And even if some bold theorist, led by the burned appearance of the rocks, and the absence of organic remains in them, had supposed some previous high temperature of these rocks to account for the phenomena, he would hardly have gone so far as to suggest that they had sprung in a liquid state from beneath the surface of the earth; still less would such a suggestion have been generally entertained.

The facility with which volcanic rocks lend themselves to cultivation, or the natural growth of vegetation, adds to the difficulty of discovering their true nature. Even with our present means of knowledge, it has been a matter of controversy whether certain districts in Europe are of volcanic origin. Some doubted whether Auvergne was a centre of extinct volcanic action, which it has now been proved to be beyond a doubt. A similar question has been keenly discussed regarding a portion of the Rhine country. Vesuvius, even, when, previous to its eruption in 1631, cattle pastured on the grassy floor of its crater, and wild boars harbored in the surrounding brushwood, might have deceived an unpractised eye, though eleven earlier eruptions of that mountain had occurred since the commencement of the Christian era.

Volcanic activity as now known to us, whether in earthquakes, volcanic eruptions, or thermal springs, in its most destructive as well as most harmless manifestations, appears to be due to the same cause. The same power which produces the earthquake in one place, in another causes an eruption from a mountain, or affects thermal springs. In noticing these several phenomena, it will be proper to begin with volcanic mountains, where effects at once the most numerous, the most striking, and the most accessible to observation, are exhibited, premising that this notice includes *active* volcanoes only, by which is meant those volcanoes, eruptions

of which have been recorded, or are believed to have occurred during man's existence on the globe.

Among *ACTIVE VOLCANOES* the variety is very considerable. The district which forms the kingdom of Naples affords several examples of these differences. The volcano of Stromboli, one of the Lipari islands, is a perpetually bubbling caldron of heated lava; Vesuvius and Etna exhibit their powers only at distant intervals. The Solfatara of Puzzuoli emits smoke and gases, but does not show any further activity; while the elevation of Graham Island, to the S. W. of Sicily, within the last thirty years, exhibits another variety of volcanic power. If we turn our eyes to the New World, and to the great ocean beyond, we find a more striking change. Mount Etna, the highest of the European volcanic mountains, is about 10,000 feet high, and holds an isolated position. But in South America, the volcanic vents crown a chain of mountains stretching from one end to the other of that continent, and they in some cases attain an elevation of 22,000 feet. The great ocean lying between America and Asia contains many volcanic mountains of great elevation; some of them isolated, but the greater number arranged in a peculiar manner, which will be described below.

There are, then, great differences in the size and position of volcanic mountains, and in the mode in which they show their activity. Nevertheless, descriptions of eruptions from those mountains whose activity is intermittent, resemble each other so closely that the history of one is very much that of all, and this similarity is not limited to the external circumstances—the dreadful thunder, the darkness, the torrents of mud; but equally holds in regard to the matter ejected from the interior of the mountain. Not only is the matter thrown out by volcanoes at the most distant parts of the world (with few exceptions) alike in form, but it is almost identical in ultimate composition. We find that lava, scorie, ashes, and other products, proceed from all or almost all volcanoes, and these products, when tried by the chemist, yield nearly the same ultimate elements.

Eruptions are generally preceded by loud subterranean noises, and frequently by slight shocks of earthquakes. The sounds are described as being sometimes of the most awful description. Humboldt mentions that the ceilings in the palace at Portici, at the foot of Vesuvius, were cracked by the mere effect of the concussion of the air. The noise is said by some to resemble discharges of heavy artillery, and "awful roarings." On the occasion of an eruption of the volcano of Cozeguina, in Central America, the explosions are said to have been heard over an area of nearly 1500 miles in diameter. During an eruption of Mount Tomboro, in Sumbawa, one of the smaller islands of the Indian Ocean, the sounds were heard in Sumatra, at a distance of 970 geographical miles, and at Ternate, in an opposite direction, at a distance of 720 miles. At the time when these sounds are issuing from beneath the ground, columns of dense smoke are seen to issue from the crater of the volcano. The smoke occasionally assumes a very peculiar appearance, called by the Italians "the pine," from its resemblance to the umbrella-shaped trees of this kind which occur in Italy. Sometimes this cloud extends over so great an area as to produce total darkness in the neighborhood of the volcano, and it is then accompanied by the fall of volcanic sand and ashes, which attain a depth of several feet. In the eruption in the island of Sumbawa, just alluded

to, the ashes were carried to a distance of 300 miles on the side of Java, and 270 in the direction of Celebes. The darkness on the island of Java was so profound that it exceeded that of the darkest night. At a distance of forty miles from the volcano the ashes fell in such quantities that in spite of the minuteness of the particles they broke into the house of the resident at Bima, rendering that, as well as other houses in the town, uninhabitable. Immense quantities of stones of different sizes, mixed with ashes and sand, are now cast up from the mouth of the crater. In the eruption of Vesuvius which occurred in 1779, a huge red column of liquid lava, mixed with stones, was projected to a height, according to Sir William Hamilton, of 10,000 feet. This mass falling back on the mountain covered its whole cone, as well as part of the adjacent summit of Somma, with red-hot matter. The entire mass of fire was estimated to have had a breadth of two miles and a half; and the heat from it was felt at a distance of six miles. The projectile force occasionally exercised on these occasions may be judged of by the fact, that the volcano of Cotopaxi, in South America, ejected to a distance of eight or nine miles a mass of rock about one hundred cubic yards in volume. In 1822, Vesuvius threw out a mass of lava, of many tons in weight, to a distance of three miles. The eruption has now reached the point at which the molten lava begins to flow either over the crater or from lateral vents. It flows in a dark sluggish stream, being sometimes of great breadth and depth, and always carrying destruction in its path. At the eruption of Etna, which occurred in 1792, it is mentioned that the liquid lava streams were often thirty feet high, but where they passed over streams of old lava, they reached the height of 300 feet. At the eruption of the same volcano in 1832, a stream of lava flowed from one of the lateral craters towards the town of Bronte, eight miles distant. Within two miles of that town the stream extended to the breadth of one mile, and was thirty feet high, having then travelled in the course of its windings over a distance of eighteen miles. The town appeared to be in imminent danger, but fortunately the stream was diverted into another channel by the nature of the ground over which it had to pass.

The progress of the lava is generally very slow. In the instance just mentioned, the stream appears to have taken fourteen days or more to travel eighteen miles. Two miles in the first twenty-four hours is mentioned as the rate at which a lava current flowed, which, in the year 1819, spread itself over the Val del Bove, at the foot of Etna. On the other hand, slow though its progress be, it continues in some cases to advance for a time after its first eruption, which appears almost incredible. Nine months after the first emission of the current just alluded to, it was observed by Mr. Scrope to be advancing at the rate of about a yard an hour. The rate of speed assumed by lava streams differs, however, according as they descend a more or less inclined surface. The height from which they are ejected appears to exercise a double influence; for lava springing from a low source is generally in a more liquid state than that from a more elevated crater; and craters of low elevation also throw out a much greater quantity of lava. The highest volcanoes of South America do not at present discharge lava; and in the case of those volcanic mountains which, rising to a considerable elevation like Etna and the peak of Teneriffe, continue to emit lava, it is remarked that this discharge more

frequently occurs from lateral vents than from the summit of the craters. The lava currents from Vesuvius appear to flow with greater rapidity than those from Etna. In Iceland, where the heights of the volcanoes do not much exceed that of Vesuvius, the lava currents are remarkable for their magnitude and the rapidity of their current. River channels, from 400 to 600 feet in depth, and nearly 200 in breadth, are stated to have been filled up by them, and in the level country they have sometimes extended over areas varying from twelve to fifteen miles wide, and had a depth of 100 feet. The currents in some instances travelled forty and fifty miles. It has been calculated that the mass of lava poured out by the one volcano of Skaptar Jökul, in Iceland, during an eruption of two years' duration, would be sufficient to cover all the coal fields of the British islands to a height of twenty feet, or to bury London under a mountain rivaling the peak of Teneriffe.

It is mentioned by Mr. Stephens* that the mountain of Izalco, in Honduras, which he (in 1839) estimates to have an elevation of 6000 feet, had been formed during the memory of the curate of Zonzonate. Only forty-one years before, this mountain existed as a small orifice, "puffing out small quantities of dust and pebbles." The volcano is in constant activity.

It remains to notice the torrents of mud which frequently accompany a volcanic eruption. They flow, sometimes with great violence, down the sides of the mountain, and are spread out at the foot over considerable areas, doing much damage to cultivated land. It was in such a stream that Herculaneum was in the first instance enveloped. The flanks of Etna have suffered much from the same cause. Mud torrents from mount Carguairazo, in South America, are said, on one occasion, to have covered a surface of about forty miles square. Similar streams from Tunguragua (in 1797) filled valleys 1000 feet wide to a depth of 600 feet. In South America, these streams have sometimes brought with them small fish, in such numbers as, it is believed, to have produced fevers by their decay. The formation of watery streams is ascribed partly to the condensation of large quantities of vapor severally discharged from volcanoes, and, in particular cases, to the melting of the snows which cover the higher volcanic mountains of the world. Rushing down the inclined sides of the mountain, the streams carry with them all loose matter which has settled on the cone, and deposit it at the foot. The presence of fish in the deposits is thus explained by Humboldt. He states that certain of the volcanic mountains of the Andes enclose large subterranean lakes, which communicate with the streams from the higher table-lands. Fish are thus introduced into the reservoirs, where they are said to multiply in an extraordinary manner. When the mountain is convulsed by a volcanic paroxysm, the waters find an exit through the fissures, and pour forth their contents over the plains. Thus the produce of volcanoes is distributed as sedimentary matter round their bases, and may enclose organic remains to yield future information to the geological inquirer.

The destruction of life from volcanic eruptions is not so great as might perhaps be expected from the magnitude of the phenomena, and when it does occur, it is as much, or more, owing to other causes than to the flow of lava. For lava is so

* Central America.

slow in its progress as generally to give time for escape. The lives lost in Pompeii and Herculaneum were few, and are to be attributed not to lava, which did not reach either of those towns at the time of their destruction, but to mud streams and aerial showers. "More havoc," says Sir C. Lyell, "is occasioned in a few years by the malaria fever of the Maremma of Tuscany, and of the Campagna of Rome, than by Vesuvian lavas in as many centuries." Perhaps no parts of the world are more richly cultivated, or support a more numerous population, than the neighborhoods of Vesuvius and Etna. This is not, however, to be attributed to immunity of the inhabitants from loss by volcanic eruptions. The experience afforded in South America shows that people are with difficulty driven from a spot otherwise suitable to them, and endeared to them through long association, by an amount of risk however great. The districts at the foot of Etna and Vesuvius have, at different times, suffered extensively from eruptions. Torre del Greco has been twice destroyed by lava, more than four hundred persons having perished on one occasion. In 1669, part of the town of Catania, at the foot of Etna, and fourteen other towns and villages, were destroyed by lava. Thucydides records three eruptions of Etna, by one of which Catania was injured; but the skirts of Etna appear to have suffered more from floods than from lava. In other parts of the world much damage has occasionally been done by volcanic eruptions. The island of Sumbawa was almost entirely depopulated by the eruption of 1815, only twenty-six persons out of a population of 12,000, having survived. The eruption was accompanied by violent whirlwinds and extensive changes in the level of the land, to which the great loss of life may be chiefly attributed. In the island of Lancuok, one of the Canary islands, eruptions continued for five years (from 1730 to 1736). The lava appears to have flowed at first with unusual rapidity. Several villages were destroyed, and other damage ensued. Many of the inhabitants left the island. An eruption of Skaptar Jökul, in 1783, was also very destructive, particularly to animals.

We shall conclude our general description of the phenomena of volcanic eruptions with descriptions of particular eruptions. For the first, we borrow from "Squier's Geographical and Topographical features of Nicaragua." The account refers to the volcano of Cozoguina, in Central America.

On the morning of the 20th January, 1835, several loud explosions were heard for a radius of a hundred leagues around this volcano, followed by the rising of an ink-black cloud above it, through which darted tongues of flame resembling lightning. This cloud gradually spread outward, obscuring the sun, and shedding over everything a yellow sickly light, and at the same time depositing a fine sand, which rendered respiration difficult and painful. This continued for two days, the obscuration becoming more and more dense, the sand falling more thickly, and the explosions becoming louder and more frequent. On the third day the explosions attained their maximum, and the darkness became intense. Sand continued to fall, and the people deserted their houses, fearing the roofs would yield beneath the weight. This sand fell several inches deep at Leon, more than 100 miles distant. It fell in Jamaica, Vera Cruz, and Santa Fé de Bogota, over an area of 1500 miles in diameter. The noise of explosions was heard nearly as far, and the superintendent of Belize, 800 miles distant, mustered his troops, under the impression that there was a naval action off the harbor. All nature seemed

overawed; the birds deserted the air, and the wild beasts their fastnesses, crouching terror-stricken and harmless in the dwellings of men. The people for a hundred leagues groped, dumb with horror, amid the thick darkness, bearing crosses on their shoulders and stones on their heads, in penitential debasement and dismay. Many believed the day of doom had come, and crowded to the tottering churches, where, in the pauses of the explosions, the voices of the priests were heard in solemn invocation to Heaven. The strongest lights were invisible at the distance of a few feet; and, to heighten the terrors of the scene, occasional lightnings traversed the darkness, shedding a lurid glare over the scene. This continued for forty-three hours, and then gradually passed away. For some leagues around the volcano the sand and ashes had fallen to the depth of several feet. Of course the operations of the volcano could only be known by the results. A crater had been opened, several miles in circumference, from which had flowed vast quantities of lava into the sea, on one hand, and the gulf of Fonseca on the other. The verdant sides of the mountain were now rough, burned and seamed, and covered with disrupted roots and fields of lava. The quantity of matter ejected was incredible in amount. I am informed, by the captain of a vessel which passed along the coast a few days after, that the sea for fifty leagues was covered with floating masses of pumice, and that he sailed for a whole day through it, without being able to distinguish but here and there an open space of water. The appearance of this mountain is now desolate beyond description. Not a trace of life appears upon its parched sides. Here and there are openings emitting steam, small jets of smoke and sulphurous vapors; and in some places the ground is swampy from thermal springs. It is said that the discharge of ashes, sand, and lava, was followed by a flow of water; and the story seems corroborated by the particular smoothness of some parts of the slope. The height of this mountain is not, I think, more than 2500 feet. The anniversary of the cessation of this eruption is celebrated in the most solemn manner throughout all Central America.

Cotopaxi is one of the loftiest volcanoes of South America, and one of the most active. Its altitude is about 18,000 feet. It is situated in the province of Quito, at about thirty-six miles distance from the town of that name. Some of the phenomena of its eruptions have been described by Humboldt.

He says, that, in 1738, the flames of Cotopaxi rose 2700 feet above the brink of the crater. In 1744, the roarings of the volcano were heard as far as Honda, a town on the borders of the Magdalena, and at the distance of 600 miles. On the 4th of April, 1768, the quantity of ashes ejected by the mouth was so great, that, in the towns of Hambato and Tacunga, day broke only at three in the afternoon, and the inhabitants were obliged to use lanterns in walking the streets. The explosion which took place in the month of January, 1803, was preceded by a dreadful phenomenon—the sudden melting of the snows that covered the mountain. For twenty years before, no smoke or vapor, that could be perceived, had issued from the crater; and in a single night the subterranean fire became so active that at sunrise the internal walls of the cone, heated, no doubt, to a very considerable temperature, appeared naked and of the dark color which is peculiar to vitrified scorie. At the port of Guayaquil, 156 miles distant, in a straight line from the crater, the noises of the volcano were heard day and night, like continued discharges of a battery, and they were distinguished on the Pacific Ocean to the south-west of Puna. The mass of

scoriæ and the huge pieces of rock thrown out of this volcano and spread over the neighboring valleys would form, says Humboldt, were they heaped together, a colossal mountain.

A remarkable volcanic explosion in Mexico has been recorded by Humboldt, when the volcano of Jorullo (having an elevation of between 1500 and 1600 feet above the surrounding plain) was raised in one night. Until the middle of the 18th century the plain from which this volcano rose consisted of cultivated fields. It was surrounded by basaltic mountains which seemed to indicate anterior volcanic convulsions. In June, 1759, frightful sounds proceeded from beneath the ground, accompanied by frequent earthquakes. These lasted fifty or sixty days, but had for some time ceased, when, on the 28th of September, they recommenced, and on the 29th, from three to four square miles rose up like a bladder. Flames spread over an area of from one to two miles square. Fragments of burning rock were thrown to prodigious heights; and, through a dense mass of cinders, the ground was seen by the light of the volcanic fire to be agitated like the sea. Two rivers, which before watered the plain, were precipitated into the burning crevices, and so incited the flames, that they were perceived on an extensive plain more than 4000 feet above the plain of the volcano. Eruptions of mud and clay, enclosing rounded masses of basalt, followed. Thousands of little cones, from six to nine feet high, rose from the surface, which, when visited by Humboldt, nearly fifty years afterwards, had a temperature of 203°; from some of them issued subterranean sounds, like those of a fluid in ebullition. Besides the chief mountain of Jorullo, five other hills, varying in height from 1200 to 1500 feet, rose from the same crevice. Immense quantities of lava, both scoriaceous and basaltic were discharged, and the eruptions did not cease till the following February. The houses in Queretaro, 144 miles distant, were covered by the cinders thrown up.

It seems that the great event we have described was due to the maledictions of certain capuchin monks, who, having been badly received by the owner of the land where the fires broke out, took this mode of repaying his inhospitality. The great heat is to be succeeded by as great cold. So, at least, relate and believe the native Indians of that country.

No less worthy of attention than the eruption of Jorullo, are those which unceasingly occur from the volcanic mountain situated on Stromboli, one of the Lipari islands. This volcano has been in activity from the earliest times. It discharges at present only scoriaceous rock, for though lava constantly bubbles up in its crater, it does not pass beyond the brink. The island is about twelve miles in circumference, and the volcano is situated at the north western side of it; the present crater being about half way up the acclivity. The total height of the mountain is nearly 3000 feet, and it has two conical peaks; between them lies a plain, which appears to have formerly been a crater of eruption. The present crater is of a circular form, and has a circumference of about 340 feet. The sides are composed of a confused mass of lavas, scoriæ, and sand, and contract internally to form an inverted cone. To a person looking into the crater from above, the appearances are as follow: Red-hot liquid matter resembling melted brass is seen whirling tumultuously round, which by degrees rises towards the brink, whilst huge bubbles are

formed on the surface. Before the lava reaches the edge of the crater, these bubbles burst with a loud report, and quantities of red-hot scoriæ, accompanied by smoke and ashes, are thrown out with extraordinary swiftness. The liquid mass then, as if relieved, sinks again within the crater. The scoriæ, which are occasionally of several feet in diameter, are sometimes thrown to a height of 1500 feet. They either fall back again into the crater, or, being projected in a red-hot shower beyond the brink, roll into the sea. No flame is seen in the interior of the crater even at night, nor is the bursting of the globular masses accompanied by any appearance of this kind.

A cloud of smoke always hovers over the crater, and the sulphurous ingredients mingled with it frequently render approach inconvenient. Vapors arise not only from the crater, but from numerous apertures in other parts of the mountain. Quantities of dust pervade the air and fall at some distance from the foot of the mountain in showers like small hail. It appears to be produced by the trituration the scoriæ undergo, one against the other, either in the air or in the course of their descent towards the sea.

It is remarkable that, notwithstanding the incessant discharge of scoriaceous matter into the sea, its depth at the foot of the volcano appears to be unaltered. No doubt the frequent and violent storms, to which this part of the Mediterranean is subject, partly explain the circumstance. These seas appear, indeed, to have borne the same character from the earliest times; for the islands now known as the Lipari islands, formerly as *Æolia*, were the throne of *Æolus*, the god of the winds. Here, says Virgil*—

Vasto, rex *Æolus*, antro
Luctantes ventos, tempestatesque sonoras.
Imperio premit, ac vinclis et carcere frenat.

But there is no allusion to a volcano, unless the lines immediately following—

Illi indignantes, magno cum murmure montis
Circum claustra fremunt,

have reference to volcanic sounds.

Stromboli is a most useful beacon to sailors navigating the neighboring sea. Its light is visible, at night, at a distance, it is said, of 100 miles.

A curious variety of volcanic eruption is when an island is raised from the sea. This remarkable occurrence has occurred more than once within recent times. Two new islands were raised from the sea near the Kurile Isles, in the beginning of the present century, one of which had an elevation of 3000 feet. These islands rose from a sea more than 200 fathoms in depth. Two islands also rose, at different times, near the coast of Iceland. In 1811 an island (*Sabrina*) was thrown up to a height of 300 feet, off St. Michael's, in the Azores; but it soon disappeared. Graham Island rose from the sea in 1831. About a fortnight before the island appeared above the surface, shocks as of an earthquake were felt in a vessel passing over the spot. This was followed by waterspouts, and a discharge of dense steam, which was said to have risen 1800 feet into the air. Finally, a crater made its appearance. When first seen, it had a height only of twelve feet; it discharged scoriæ and immense columns of vapor. This was on the 18th of July. By the 4th of August, it had risen to 200 feet; after which it began to diminish, until, in

* *Æneid*, l. v. 12, et seq.

October, the island was nearly level with the sea. In 1833 there still existed a dangerous reef over the spot. The matter ejected by this crater consisted of scorice, pumice, and lapilli. No flow of lava occurred above the surface of the ocean, and the masses of matter rarely exceeded a foot in diameter; but from nine to eleven feet under water, the reef was found (in 1833) to consist in part of a black rock, which probably points out the line to which the solid material of the island rose.

The changes which have taken place in the Santorin Archipelago within historical times, afford perhaps the most interesting examples we have of the elevation of new islands.

The history of this volcanic group begins as far back as the year 233 B. C., which, referring to the Roman annals, would be in the time intervening between the first and second Punic wars. At this time, as we are informed by Pliny, the island of Therasia was separated from Santorin (the chief island of the group) by a great earthquake. Thirty-seven years afterwards, there arose a new island in the bay of Santorin. This island was christened, *Hiera-Nesos*—"the Sacred Island"—and still goes by the name of Hiera. In the year 19 of our era, a smaller island made its appearance close to the island of Hiera, to which it was subsequently united. In 726 and 1427, activity was displayed in increasing the size of Hiera. In 1573, a small island known as Micra-Kameni (the little burnt island) was added to the group. This island has a small cone and crater, 100 feet high.

Concerning the subsequent changes, we have more detailed information. M. de Thévenot, who visited the island of Santorin in 1655, relates what was told him of an eruption which occurred about eighteen years before. He says that the inhabitants were surprised one night by a violent noise, like distant cannonading, whence it was supposed that a naval engagement had taken place between the Venetian fleet and the Turks. It appeared, however, that the sounds proceeded from beneath the harbor. From morning till night pumice was thrown up with great violence and continued noise, and in such quantities that, when certain winds prevailed, the smallest vessels required the assistance of long poles to make a way for themselves out of the harbor. The air, too, was infected, so that several persons (says Thévenot) died, and many temporarily lost their sight. The sounds were heard on the island of Chios, distant more than 100 miles. Not only in Santorin, but at Chios and Smyrna, says the same authority, "all the silver became red, whether kept in coffers or in the pocket; and the religious who resided in those places told me that all their chalices became red. After some days the infection ceased, and the silver returned to its former color."

In 1650, after violent earthquakes, an eruption took place at some distance outside the bay of Santorin. No new island was raised, but the bottom of the sea was greatly elevated. Noxious vapors again made themselves known by killing more than fifty persons in Santorin, besides many animals. A wave fifty feet high arose, which broke on several of the neighboring islands. In Santorin it overthrew two churches, and exposed to view two villages, which had previously been overwhelmed by volcanic eruptions.

In 1707 and 1709, the submarine powers showed renewed activity, the consequence being the formation of two other small islands. The one was composed of white pumice, and obtained the name

of the White Island; the other, being composed of brown trachyte, was called, by contrast, the Black Island. The former island was subsequently covered, in great part, by the matter ejected from the latter, and the two islands now form one island, called Nea Kameni, (the Newburnt Island,) which has a cone 330 feet above the sea.

There is no reason to suppose that any diminution has taken place in the volcanic force having its seat under the archipelago of Santorin; it will not, therefore, be surprising should further changes take place, and other islands be added to the present number. Within the past half century, a striking change in the sea-bottom between the small Kameni and the island of Santorin has occurred. For, in 1830, MM. Virlet and Bory found a depth of only three or four fathoms where, twenty years before, the depth had been fifteen fathoms; and this elevation had taken place over a limited area only of 800 by 500 yards, beyond which the sea deepened rapidly on all sides. Reasoning from the analogy of Vesuvius, whose present crater is within the much more extended crateriform depression of Somma, it is contended by Sir C. Lyell, that the islands of Santorin, Therasi, and Aspronisi, which encircle the present gulf, are portions of a truncated cone, which formerly bounded one vast volcanic crater. He likens the formation of the small islands in the interior of the gulf to that of the modern cones of Vesuvius. By others the archipelago is considered to have been "a crater of elevation"—of the theory involved in which expression more will be said hereafter. It is a remarkable fact, that the southern part of Santorin is formed of granular limestone and argillaceous schist; the island being otherwise entirely composed of volcanic matter. The two formations are considered by Sir C. Lyell to be quite independent of each other. The volcanic mass which composes the islands consists of alternate beds of trachytic lava and tuff, which dip on every side from the centre of the bay towards the circumference, and in Santorin present precipices of from 800 to 1000 feet towards it. All the islands are covered with a white tuffaceous rock, from forty to fifty feet in thickness.

We now return to the Vesuvian type of volcanic eruption, of which the following are interesting examples.

The island of St. Philip, better known since 1680 as *Iltrado Fogo*, (the Island of Fire,) belongs to the group of Cape Verde islands. It is nearly circular, and has a diameter of about fifteen miles. Until the year 1680, it was not suspected to contain within it a destructive power. In that year, however, a great earthquake, followed by a volcanic eruption, took place, and so alarmed the inhabitants, that some of them passed over to the neighboring island of Brava. From that time until 1799, the island of Fogo has suffered much from volcanic eruptions. They proceed from a peak in the middle of the island, which has an elevation of about 9000 feet. The eruption of 1785 has been described by Sr. J. da Silva Feijo, in a memoir presented to the Royal Academy of Sciences at Lisbon. He states that a great subterranean commotion, felt over the whole island, and accompanied by the loudest thunder-like noises, was the first sign of this eruption. The peak then opened perpendicularly, and having darted into the air, at intervals, columns of scorice, cinders and stones, closed again. Between the peak and the sea, on the eastern side, numerous other vents

made their appearance, whence flowed torrents of lava, as well as cinders and smoke; the latter rising in the air, and darkening the whole neighborhood. The principal mouths were at the base of the peak on the eastern side, and gave rise to four new mountains in the same line. These new elevations also opened vertically, and threw out immense quantities of lava, which, descending towards the east, divided into two rivers of fire, one of which filled up a large and very deep valley, and the other overflowed a wide plain, where there were houses and plantations. These were for the most part overwhelmed. The streams which flowed from vents nearer the sea also inundated a large portion of land; some entered the sea, and formed a rocky projection of considerable height, where formerly there had been a bay of from thirty to forty feet in depth. This eruption lasted thirty-two days.

A subsequent eruption of the same mountain (in 1799) has been described by Dr. Castilho. The second eruption began as usual by subterranean thunder, when a great vent opened on the skirts of the peak, giving issue to smoke, cinders and sand, and producing such an obscurity that the sun seemed to have set. Half an hour afterwards it began to rain sand, which covered the whole island to a depth of from four to five inches. A mixture of sand and cinders reached the island of *Maio*, distant nearly ninety miles. During the night the whole island appeared illuminated, and it was perceived in the town, at a distance of twenty-one miles from the volcano, that a great quantity of lava had begun to flow from the vent which had previously ejected only cinders and sand. The current flowed for twenty-seven days. It broke up large stones in its course, and filled up a river, converting it, by the cooling of the lava, into an oblong elevation. It carried away many houses as well as cattle, and destroyed farms. Finally it entered the sea at a distance of about thirty feet. A bay was also formed where formerly there had been a beach.

We conclude this sketch of volcanic eruptions by mentioning the catastrophe which occurred in 1772, in the island of Java, when part of Papan-dayang, one of the loftiest volcanoes in the island, suddenly fell in, carrying with it about ninety square miles of ground. Forty villages were destroyed on the occasion; some being engulfed, and others covered up by ejected matter. Nearly 3000 of the inhabitants are said to have perished.

THE NUMBER, GEOGRAPHICAL DISTRIBUTION, AND HEIGHTS of the volcanoes now in action next demand our attention. So long as part of the earth remains unexplored by scientific persons, the actual number of volcanoes must be doubtful. All the calculations hitherto made must be regarded as approximations only to the truth. Accounts differ as to the number of volcanoes, even in parts of the world fully explored; some travellers classing as extinct, mountains which others regard as active; some giving as separate volcanoes what others class as vents subsidiary to some central mountain. Mr. Johnson* gives the total number of active volcanoes as 270, which is probably the best approximation. Of this number, about three fourths occupy the islands or the shores of the Pacific ocean. A large number (about sixty) are found in the Indian ocean, occupying the Sunda Islands. The

Atlantic ocean and Europe together number fourteen or fifteen. Two volcanic mountains are believed (on the testimony of Chinese authorities) to exist in the Thian Shan mountains, in Central Asia. In the Elburz chain of mountains to the south of the Caspian Sea, a lofty peak—the Peak of Demavend—is said to be an active volcano. The island of Zibbel Teir in the Arabian Gulf, and that of Ormus in the Persian Gulf, are also said to have exhibited volcanic activity.

There is no certainty of the existence of any active volcanoes on the continent of Africa. The islands of Bourbon on its eastern side, and the islands of the South Atlantic (noticed below) on its western, contain active volcanoes.

The arrangement of the volcanoes in the basin of the Pacific, may be compared to the letter Q, the right-hand side of the letter being formed by the volcanoes of the American continent, and the left-hand by those which skirt the Asian continent and Australia, bending round again towards the point whence they began.

The volcanoes of South America are arranged in linear groups. They commence with the Chilean group, in lat. 42°. The most southern of this group is Mount Osorno; the most northern, Maypu, which is not far from Santiago. Villarica, a volcano in constant activity, belongs to the group, which embraces at least five well-authenticated cases of active volcanoes. Just on the skirts of this district, in south lat. 32° 39', occurs the Nevado Aconcagua, which exceeds 24,000 feet in height, and is probably the highest in the world. Between 33° and 23° south lat., there do not occur any active vents.

The next centre of volcanic power is in Bolivia, between 18° 10' and 16° 20', where the Andes change their direction from being parallel to the meridian to one making an angle of 45° with that line. The mountains enclose the table-land of Zúacaca, and rise to immense elevations. The Nevado de Sorata, not an active volcano, but the second highest mountain in South America, is found among them. Sehana and Somarape, which give slight symptoms of activity, also belong to the group. The volcano of Anguipa is found on the southern extremity of Peru, in lat 16° 24'.

We must pass over 13° of latitude to reach the next group of active mountains. They extend in a meridional line over 3½°, and are found on both sides of the equator. The Peak of Sangay is the most southern, and that of Pastos the most northern volcano of the group. Six of them surround the table-land of Quito—Cayambe, Cotopaxi, Richincha, Antisana, L'Altar, and Tunguragua. Cayambe, whose summit is 19,535 feet above the sea, situated on the equatorial line. Cotopaxi is a most formidable mountain, by the frequency and magnitude of its eruptions. To the north of the equator occur Imbabura, Chiles, Cumbal, Tuqueres, Pastos, Sotara, and Purace.

We now pass to that portion of territory lying between the Isthmus of Darien and the Isthmus of Tehuantepec, which is called Central America. It is divided into three distinct parts—Costarica, Honduras, and Nicaragua, and Guatemala—each of which has a share of the thirty-nine active volcanoes which occupy the whole. These volcanic mountains are generally lower than those of the southern continent, and they are remarkably active. The district of Guatemala contains seventeen volcanic vents. The cities of Old and New Guatemala are situated at the foot of three of the most

* Physical Atlas.

considerable—Agna, Pacayo, and Fuego. The former pours out boiling water and stones, and has twice destroyed the old city. The lake of Nicaragua is separated from the Pacific by a line of active volcanoes.

The volcanoes hitherto noticed have generally been arranged in a line with the great chain of the Andes. The Mexican volcanoes, which come next under notice, occupy a transverse position—and stretch from the Atlantic to the Pacific Ocean, at an average distance of about sixteen miles south of the city of Mexico. According to Humboldt there are only five active volcanoes in Mexico—Tusla, Orizaba, Popocatepetl, Jorullo, and Colima. Later authorities add to these Iztaccihuatl and Toluca. The peak of Orizaba is constantly in a state of ignition, and from its appearance, when seen at a distance, it has obtained from the Indians the name of the "Mountain Star."

It does not appear that any active volcanoes occur in California. One, St. Helens, is found on the banks of the Columbia river. Another, Mount Edgecumbe, occurs in about north latitude 56°. Whether Buen Tempo and Mount Elias, still further north, are active volcanoes, is doubtful.

A region of great volcanic activity next occurs. It extends over the peninsulas of Alayska and Kamtschatka and the Aleutian Islands. It has been estimated to contain at least fifty-seven active volcanoes.

The volcanic girdle next includes the Kurile islands, in which eighteen active volcanoes are reckoned. The islands composing the empire of Japan contain a still greater number. A few volcanoes, which occur in small islands lying to the south of Japan, connect the Japanese group with the volcanoes of the Philippine islands, and the Moluccas. Thence branches off the remarkable chain of volcanoes beginning with the island of Timorlant, passing through Java and Sumatra, and ending at Barren Island in the Bay of Bengal. The greater part of these vents lie between 7° and 9° south latitude, and the volcanic forces are very energetic. The island of Java, where thirty active volcanoes are reckoned by some, and thirty-eight by others, has suffered from eruptions of unusual frequency and magnitude. The mountains, which rise to great elevations, are detached and situated on the eastern part of the island. Some are in perpetual ignition. One has a large crater filled with boiling water.

Returning to the Molucca islands, we find the volcanic chain continuing eastward through the northern part of New Guinea, through New Britain New Ireland, and the Solomon islands. Thence it turns south-east towards New Zealand, with which it is connected by volcanoes in the New Hebrides.

Besides the immense loop thus formed by the volcanoes which fringe the Pacific, there are other volcanoes scattered over islands in the interior of the basin. Almost all the islands of the Pacific which attain a considerable height are of volcanic origin. The Friendly islands, the Sandwich islands, the Ladrões, and the Galapagos islands are subject to volcanic eruptions. The antarctic continent, discovered by Sir James Ross, is volcanic. In latitude 77° 31', and longitude 167° 1', a mountain was discovered which discharged dense columns of black smoke. Its altitude was 12,367 feet. It has been named Mount Erebus. An apparently extinct crater near to it, of almost equal elevation, was named Mount Terror.

The volcanoes of Europe consist of three groups—the Italian, the Icelandic, and the group of Santorin. The first consists of Etna, Vesuvius, Stromboli and Epomeo, the last being situated on the island of Ischia, and not having broken out since the year 1302.

The Icelandic group comprehends the two islands of Iceland and Jan Meyen. On the former are reckoned six volcanoes, one of which, Kraabla, is in constant activity, and on the latter, one. The third group has already been fully noticed.

It remains to notice the volcanoes of the southern Atlantic ocean and those in the West Indian islands. The Azores, Canaries and Cape Verde islands, situated almost on the same parallel of longitude, contain active volcanoes. Among the West Indian islands active volcanoes occur on St. Vincent, Guadeloupe, and St. Christopher, besides some active ones on some of the other islands.

It has often been noticed, that, with hardly any exceptions, the active volcanoes of the world are found either on islands, or, if on continents, in situations near the sea-shore. There are, it is true, exceptions to this rule, both in Central Asia and in America. But it is thought to remove the objection in the former case, that those mountains are situated in the neighborhood of large lakes. In the latter case, also, though some of the volcanoes are distant 100 miles or more from the sea, the chain of which they form a part can be traced to near proximity with it. The same rule appears to hold good in regard also to the seats of extinct igneous action. The ancient volcanoes of Auvergne, of the Rhine Valley, of Hungary and Transylvania, and of the Cucernean islands were neighboring to wide expanses of fresh water, or to the sea, when the powers now extinct were active. It is also deserving of notice that earthquakes appear to follow the same law of geographical distribution as volcanoes. "Almost all the great earthquakes," says Mrs. Somerville,* "have their origin in the bed of the ocean;" and, where this is not the case, they generally have their seat near the coast.

The heights of sixty-three principal volcanoes of the world have been given by Mr. Johnston in his "Physical Atlas," namely, in

Europe and Atlantic islands,	9
Asia and neighboring islands,	14
North America (including Mexico,)	18
Central America,	10
South America,	11
Australia and Polynesia,	7

The heights of these volcanoes may be thus conveniently arranged:—

EUROPE AND ATLANTIC ISLANDS—NINE.

Feet.		
12,000+ ... One	}	The peak of Teneriffe, whose exact height is 12,182 ft.
10,000+ ... One		Mount Etna, the exact height being 10,374 ft.
9,000+ ... One		Fogo, in the Cape Verde.
7,000+ ... One		Pico, in the Azores.
6,000+ ... One		Mt. Beren in Island of Jan Meyen.
5,000+ ... Two		Mt. Hecla and Kotlugia in Iceland.
3,000+ ... One		Vesuvius, exact height 3,943 ft.
2,000+ ... One		Stromboli.

ASIA AND NEIGHBORING ISLANDS—FOURTEEN.

15,000+ ... Two	}	One of these is found in Kamtschatka, the other in Sumatra.
14,000+ ... One		Demavend.

* Physical Geography.

13,000+ ... Two	} In Sumatra.
12,000+ ... One	
9,000+ ... Two	
8,000+ ... Two	
7,000+ ... Three	} In Java and Kamtschatka.
6,000+ ... One	
5,000+ ... Two	} In Sombok island & Kamtschatka.
4,000+ ... One	
3,000+ ... Three	} One of these is the Volcano of Tom- bora, on the Island of Sumbawa;
2,000+ ... One	
1,000+ ... One	} the other two are in Java.
500+ ... One	
200+ ... One	} Zibbel Teir.
100+ ... One	

NORTH AMERICA—TWELVE.

17,000+ ... Three	} These are Mt. Elias, on the north- west coast of North America, about which being an active vol- cano some doubt exists; and the two Mexican volcanoes of Popo- catpetl and Orizaba.
15,000+ ... Two	
14,000+ ... One	} Iztaccihuatl and Toluca, both Mex- ican volcanoes.
13,000+ ... Two	
12,000+ ... One	} Buen Tempo, situated between Mt. Elias and Mt. Edgcombe.
11,000+ ... One	
10,000+ ... Two	} The two peaks of Mt. Amilpas.
9,000+ ... One	
8,000+ ... One	} Jorullo.
7,000+ ... One	
6,000+ ... Two	} One of these belongs to the Aleu- tian Islands; the other is Mount Edgcombe.
5,000+ ... One	
4,000+ ... One	} In the Aleutian Islands.
3,000+ ... One	

CENTRAL AMERICA AND THE ADJACENT ISLANDS—TEN.

18,000+ ... One	} Zolima.
16,000+ ... One	
12,000+ ... One	} Atitlan.
11,000+ ... One	
10,000+ ... One	} Trasu, or Volcano de Cartago.
9,000+ ... Two	
8,000+ ... Two	} In Guatemala.
7,000+ ... One	
6,000+ ... One	} In St. Vincent, and Gaudaloupe.
5,000+ ... One	
4,000+ ... One	} Mt. Misery, in St. Christopher's.
3,000+ ... One	
2,000+ ... One	} Izalco.*
1,000+ ... One	

SOUTH AMERICA—ELEVEN.

22,000+ ... Two	} Somarape and Sehama.
20,000+ ... One	
19,000+ ... One	} Arequipa.
18,000+ ... One	
17,000+ ... One	} Antisana.
16,000+ ... One	
15,000+ ... One	} Cotopaxi.
14,000+ ... One	
13,000+ ... One	} Chipicani.
12,000+ ... One	
11,000+ ... One	} Tungaragua.
10,000+ ... One	
9,000+ ... Two	} Cumbal and Pichincha.
8,000+ ... One	
7,000+ ... One	} Antuco.
6,000+ ... One	
5,000+ ... One	} Osorno.
4,000+ ... One	

AUSTRALIA AND POLYNESIA—SEVEN.

13,000+ ... Two	} These are situated in the Island of Hawaii.
12,000+ ... Two	
11,000+ ... One	} Mount Erebus and Sesarga, (in the Salomon Isles.)
10,000+ ... One	
9,000+ ... One	} In Hawaii.
8,000+ ... One	
7,000+ ... One	} Tanna, in the New Hebrides.
6,000+ ... One	

Omitting the irregularly active volcanic centre of Santorin and the volcano of Epomeo, which has only once broken out within record, we may consider the active volcanoes of Europe to be three. The volcanoes of the world amount, as before stated, to 270. Comparing the heights of Vesuvius and Etna (Stromboli is lower than either) with the other heights just given, we find that out of sixty-three elevations, there are thirty-two which exceed Etna, and fifty-two surpassing Vesuvius. The mean height of Vesuvius and Etna is 7,411 feet. The mean height of the sixty-one others is 10,677 feet. Mounts Somarape and Sehama are more than twice the height of Mount Etna, and more than five times that of Vesuvius.

* The great difference between the height given by Mr. Joannston to this mountain and that given by Mr. Stephens, may probably be accounted for by the heights having been taken at different times. We may here remark, however, that authorities seldom quite agree regarding the height of mountains.

Respecting the average frequency of volcanic eruptions on the globe, it may be stated that, according to Sir Charles Lyell, about fifty eruptions occurred during the last century within the five European volcanic districts of Vesuvius, Etna, Lipari Isles, Santorin, and Iceland. Computing these to be about one fourth of the volcanic groups of the globe, which latter are considered to have about an equal activity, he reckons that about two thousand volcanic eruptions occur on the globe in the course of a century; or about twenty every year.

The reader having learned from what precedes the general distribution of the volcanoes of the world, and the heights which the most remarkable of them attain, and having gained a general idea of the phenomena exhibited during eruptions, will be interested in the following outlines of narratives of the ascent of two among the highest volcanic mountains in the world—Popocatepetl in Mexico, and Mauna Loa in Hawaii, (one of the Sandwich islands.) It will thus appear in what state these mountains are generally found.

Popocatepetl, or the smoke-mountain, is the highest volcanic mountain of the Mexican group. Its elevation exceeds 17,000 feet. It is situated about fifty miles to the east-south-east of the city of Mexico. It is in the shape of a truncated cone. It is situated on the edge of the elevated plateau on which the city of Mexico stands. On one side, therefore, it rises almost from the level of the sea, and on the other from an already high plateau. The appearances of the two sides of the mountain correspond to their difference of position. The whole of the north-west side is clothed below the snow-line with forests of firs, which mingle at the foot with corn, maize and the other European plants which are cultivated at that elevation. On the opposite side, also, occurs a zone of forest trees; but below it other zones occur, which change at almost every step you descend, till in the valley itself, the region of the cactus, the sugar-cane, and the palm would be reached. The snow-line is lower on the northern than on the southern side.

In October, 1519, Cortez and his army passed by Popocatepetl; they were then on their way to besiege the capital of Mexico. Attracted by the novelty of a huge mountain discharging smoke, he sent ten of his most courageous soldiers to "find out the secret." They did not succeed, however, in reaching the summit, owing to the snow and the discharge of cinders. Subsequently, in 1522, after the capture of the city, the Spaniards succeeded in reaching the crater; and, either from this or some other volcanic mountain, sulphur was procured for the manufacture of gunpowder. Cortez, in one of his letters to his sovereign, states this to have been effected by letting a man tied to a cord down into the crater. Humboldt, who records these facts, further relates that a certain Dominican, Blasde Iñena, armed with an iron spoon and pail, caused himself to be let down in an osier basket into the crater of the Cerro de Massaya, in Granada, for the purpose of gathering gold. To what extent he would have enriched himself, we are left to infer, his pail having unfortunately been melted by the heat. What became of the spoon we are not informed; the osier basket reached the top with difficulty, bringing a poorer, but perhaps wiser, man. The dean of the chapter of the town of Leon obtained formal permission from the court of Madrid "to open the same volcano, and to gather

the gold which it contained." It does not appear, however, what success attended his operations.

It was from the southern side that, in the year 1834, Baron Gros, secretary to the French legation at Mexico, M. de Gerolt, Consul-general for Prussia, and Mr. Egerton, an English artist, commenced their arduous duty of ascending Popocatepetl. The expedition started, says Baron Gros, at seven o'clock in the morning:—

At three, we had arrived at the limits of vegetation, which we reached by almost beaten tracks, having had occasion to use our axes in one place only. To any one acquainted with the Alps, I need not say one word of those stupendous forests of oak, or fir, and of larch, which must be traversed; they are alike in both hemispheres, save at the foot of this mountain are to be found numerous flocks of guacamaias, large green parrots with green heads. There are also in the forests a small species of lion, jaguars, wolves, stags, roes, and a great quantity of wild cats; but we did not see a single one of all these animals. In proportion as we ascended into the wood, the firs became less frequent and of smaller size. Near the sands they are all more or less stunted; and all their branches bend down to earth as if they sought lower down air less rarefied. * * * From the moment the wood is left behind, nothing is to be seen up to the third part of the volcanic cone, but an immense extent of violet-colored sand, so fine in some places that the wind ruffles the surface of it with the perfect regularity of a ripple on the waters. Blocks of red porphyry are scattered up and down, and break the monotony of the spectacle. The top of the undulations formed by the sand is covered over by an immense quantity of little yellowish pumice-stones, which the winds appear to have gathered there in heaps; and along these sands run in furrows, till they are lost in the forest, some scoriae of volcanic rocks descending from the masses of porphyry and black lava which form the top of the mountain. The most elevated part of the volcano is entirely covered with snow, and this snow seems the more purely white that the horizon along which it lies is of a blue so deep as almost to be black.

The baron and his party passed the night on the borders of the forest, setting off again at three o'clock on the following morning. The usual sensations experienced by persons who ascend to great elevations are recorded by Baron Gros. He also adds:—"It was necessary to cry very loud in order to be heard at a distance of twenty paces. Indeed, the air at that height was so rarefied, that I tried in vain to whistle, and Mr. Egerton had the greatest difficulty in extracting any sounds from a horn he had brought with him." At three o'clock, the baron and his two companions had reached the summit of the volcano, which proved to be the brink of the crater:—

The crater (says Baron Gros) is an immense gulf, almost circular, having a deep depression on the north side, and some spiracles on the south. It might be about a league in circumference, and nine hundred or a thousand feet in perpendicular depth. The walls of the gulf were peaked. They distinctly present three large horizontal strata, intersected perpendicularly and almost at equal distances by black and grayish lines. The bottom is a funnel, formed by successive convulsions, still occurring almost daily. The inside edge, from the surface to about fifteen or twenty feet lower, is a mass of red, black, or whitish, very thin strata, upon which rest the blocks of volcanic rocks yet destined to fall into the crater. Its walls are yellowish, and present at first glance the appearance of a limestone quarry. The bottom and the inclined plane of the funnel are covered with an immense quantity of blocks of sulphur, perfectly pure. From

this abyss are emitted, whirling round with the force of a whirlwind, masses of white exhalations, which disperse when they attain half the height of the inside of the crater. Some apertures in the declivity of the funnel project these also, as do likewise seven large fissures which are between the strata forming the edge of the crater; but these last vapors do not rise higher than fifteen or twenty feet. The apertures at bottom are circular and surrounded by a large zone of pure sulphur. * * * The disengagement of the sulphurous gas is so considerable that we were greatly incommoded by it at the top of the volcano. * * * The outward edge of the crater is entirely devoid of snow, but in the inside where the sun has no power, a considerable number of stalactites of ice are found hanging down to where the third stratum begins. The summit of the volcano is a small platform of fifteen or twenty feet in diameter, where the same violet-colored sand is found, which is in such abundance at the base of the cone, and the heat of which is sensible to the touch.

The island of Hawaii, or Owyhee, is the largest of the Sandwich Islands; it is of an irregular shape, being about one hundred miles long from north to south, and eighty miles wide in the broadest part. The interior of the island consists of a table-land 8000 feet above the level of the sea, on the edges of which are situated the three volcanic mountains of Mauna Kea on the east, Mauna Loa at the south-western corner, and Mauna Hualalai on the western side, the two last being still active.

The ever active volcanic crater of Kilanea occupies a shoulder, or terrace, on the eastern slope of Mauna Loa. Mauna Loa was ascended, in December, 1840, by a party belonging to the United States Exploring Expedition, and it is from the narrative of that expedition that the following notice is taken. The height of this mountain is given by them as 13,760 feet. After considerable labor the platform on which Kilanea is situated, at a height of about 4000 feet above the sea, was attained. At this point Mauna Loa rose up in all its proportions.

The whole dome appeared of a bronze color, and its uninterrupted smooth outline was relieved against the deep blue of a tropical sky. Masses of clouds were floating around it, throwing their shadows distinctly on its sides, to which they gave occasional relief and variety. There was a bluish haze resting on the plain, that apparently gave it great distance, though this was partially counteracted by the distinctiveness of the dome.

The party now approached the crater of Kilanea.

Vapor issuing from numerous cracks showed that we were passing over ground beneath which fire was raging. The rushing of the wind past us was as if it were drawn inwards to support the combustion of some mighty conflagration. When the edge is reached, the extent of the cavity becomes apparent, and its depth became sensible by comparison with the figures of some of our party who had already descended. The vastness thus made sensible transfixes the mind with astonishment, and every instant the impression of grandeur and magnitude increases. To give an idea of its capacity, the city of New York might be placed within it, and when at its bottom would be hardly noticed; for it is three and a half miles long, two and a half wide, and over a thousand feet deep. A black ledge surrounds it at the depth of 660 feet, and thence to the bottom is 384 feet. The bottom looks, in the day time, like a heap of smouldering ruins. The descent to the ledge appears to the sight a short and easy task, but it takes an hour to accomplish. * * * All usual ideas of volcanic craters are dissipated upon

seeing this. There is no elevated cone, no igneous matter, or rocks ejected beyond the rim. The banks appear as if built of massive blocks, which are in places clothed with ferns, nourished by the issuing vapors. What is wonderful in the day becomes ten times more so by night. The immense pool of cherry-red liquid lava, in a state of violent ebullition, illuminates the whole expanse, and flows in all directions like water, while an illuminated cloud hangs over it like a vast canopy.

The crater contains two lakes of liquid lava, the larger of which is estimated at 1500 feet long, and 1000 wide. At a height of 500 feet above the larger lake the light was so strong that the smallest print could be read.

I was struck (says the narrator) with the absence of any noise, except a low murmuring, like that which is heard from the boiling of a thick liquid. The ebullition was (as is the case where the heat is applied to one side of a vessel) most violent near the northern side. The vapor and steam that were constantly escaping were so rarefied as not to impede the view, and only became visible in the bright cloud above us, which seemed to sink and rise alternately. We occasionally perceived stones, or masses of red-hot matter, ejected to the height of about seventy feet, and falling back into the lake again. The lake was apparently rising, and wanted but a few feet of overflowing its banks. The immense space which I have described the crater as covering, is gradually filled with the fluid mass of lava to a certain point, above which the walls, or the surrounding soil, are no longer able to bear the pressure; it then finds vent by an eruption, previous to which, however, a large part that is next to the walls of the crater has, in a measure, become cooled, and remains fixed at the level it has attained. After the eruption, the central mass therefore alone subsides three or four hundred feet, and leaves the portion that has become solid forming a kind of terrace or shelf; this is what constitutes the "black ledge," and is one of the most striking features of the crater. Its surface is comparatively level, though somewhat uneven, and is generally coated with a vitreous, and in some places a scoriaceous lava, from half an inch to an inch thick, very brittle. * * * The crackling noise made in walking over this crisp surface (like a coating of blue and yellow glass) resembles that made by treading on frozen snow in very cold weather. Here and there are seen dark pits and vaulted caverns with heated air rushing from them. Large and extended cracks are passed over, the air issuing from which, at a temperature of 180°, is almost stifling. Masses are surmounted that it would seem as if the accumulated weight of a few persons would cause to topple over, and plunge into the fiery pool beneath. * * * From many places on the black ledge a bluish smoke was seen issuing, smelling strongly of sulphur, and marked by an efflorescence of a white tasteless powder among the cavities; this it was difficult to detach without scalding the fingers. There were many cracks where our sticks were set on fire, and some places in the vaulted chambers beneath where the rock might be seen red-hot. The black ledge is of various widths, from 600 to 2000 feet. It extends all around the cavity, but it is seldom possible to pass around that portion of it near the burning lake, not only on account of the stifling fumes, but of the intense heat. In returning from the neighborhood of the lake to the point where we began the ascent, we were one hour and ten minutes of what we considered hard walking, and in another hour we reached the top of the bank. * * *

At the north-west angle of the black ledge there was a descent to the bottom of the crater, where a portion of the ledge had fallen in and afforded an inclined plane to the bottom. Two of the party

succeeded in reaching the floor of the crater by this means.

Like the black ledge, it was not found to have the level and even surface it had appeared from above to possess; hillocks and ridges, from twenty to thirty feet high, ran across it, and were in some places so perpendicular as to render it difficult to pass over them. The distance they traversed below was deceptive, and they had no means of ascertaining it but by the time it took to walk it, which was upwards of two hours from the north extreme of the bottom to the margin of the large lake. It is extremely difficult to reach this lake on account of its overflowing at short intervals, which does not afford the fluid mass time to cool. The nearest approach that any one of the party made to it at this time was about fifteen hundred or two thousand feet; they were then near enough to burn their shoes and light their sticks in the lava, which had overflowed during the preceding night. The smaller lake was well viewed from a slight eminence. This lake was slightly in action; the globules (if large masses of red fluid lava, several tons in weight, can be so called) were seen heaving up at regular intervals six or eight feet in height; and smaller ones were thrown up to a much greater elevation. At the distance of fifty feet no gases were to be seen, nor was any steam evident; yet a thin smoke, like vapor, arse from the whole fluid surface: no puffs of smoke were perceived at any time.

From time to time the surface of the heated fluid would crack and exhibit a bright red glare. From these cracks streams of lava issued, so as gradually to extend the boundaries of the lake, and to drive the observers from their position.

The exploring party, having satisfied their curiosity at the volcano of Kilanea, proceeded to complete the task of ascending Mauna Loa. This was not accomplished without difficulty.

Nothing (says the narrative) can exceed the devastation of the mountain; the whole area of it is one mass of lava, that has at one time been thrown out in a fluid state from its terminal crater. There is no sand or other rock; nothing but lava, on whichever side the eye is turned. To appearance it is of different ages; some of very ancient date, though as yet not decomposed; and the alternations of heat and cold, with rain and snow, seem to have united in vain for its destruction.

A fall of snow took place before the summit was reached. The thermometer at the summit stood at 15°. The view from the summit is thus described:—

In the distance, [towards the north,] the island of Mani emerged from and broke the line of the deep blue horizon, while its lower side was dimmed by a whitish haze, that seemed to unite it to the island of Hawaii. The same haze enveloped the hills of Kohala on our right, and the western extremity of Hawaii. Nearer to us was Hualalai, up whose sides a compact mass of white fleecy clouds was impelled by the sea-breeze. To our right, rose in bold relief Mauna Kea, covered with its snowy mantle; and at our feet was spread out, between the three great mountains, the black plain of lava, overhung by a dusky pall of clouds. All these features were so blended into each other by the mist, as to exhibit a tone of harmony that could hardly be conceived, considering the variety of the forms, characters, and distances of the objects, and which seemed to blend earth, sea, and sky into one.

The terminal crater is thus described:—

This crater, or rather craters—for there are two separated by a narrow partition of compact lava and clinkers—is an immense depression, with an elevated

Lrim about twenty miles in circumference, which gradually narrows by successive ledges to the depth of eight or nine hundred feet. It has been dormant for many years, but is still filled with fissures and caverns, which emit steam and sulphureous vapors.

It took an hour to descend to the bottom of the crater, which was effected (by some of the party only) on the east side, among large blocks of lava.

There (says the narrative) they were surrounded by huge clinkers and ridges, running generally north and south in lines across the crater; between these was the *pahoikoi*, or smooth lava. They passed over these obstructions to the south-west, and found in places many salts, among which were sulphate of soda and sulphate of lime. Four fifths of the way across was a hill two hundred feet high, composed of scoriae and pumice, with fissures emitting sulphurous acid gas. To the west was a plain full of cracks and fissures, all emitting more or less steam and gas. They found the west wall perpendicular; its lower strata were composed of a gray basalt. For three fourths of the distance up, it had a dingy yellow color; above this there are a number of thin layers, apparently dipping to the south-west with the slope of the mountain. Many steam-cracks on the north-east side were also visited, from which fumes of sulphurous acid gas were emitted; no hydrogen was found in the gas, which extinguished flame without producing explosion.

EARTHQUAKES consist sometimes in slight tremblings of the earth; at other times the ground undulates like the sea. Occasionally a sudden upward motion is communicated to it; and, in some instances, a rotatory motion takes place. The two latter are the most destructive forms. The undulations vary in height from one inch to two or three feet. When the height is great, very remarkable effects are produced. During the terrible earthquake by which Calabria was devastated in 1783, large tracts of land were conveyed from their original position to distances of more than half a mile. Humboldt mentions, that, on one occasion, furniture was carried from one place and buried in another, and some persons were thrown across a river to a considerable height up the opposite mountain. During a severe earthquake in the island of Jamaica, in 1692, persons were swallowed up in rents of the earth, and afterwards ejected alive. The same thing took place in Calabria. A rotatory motion is produced where two waves, advancing in a horizontal direction, cross each other. A curious instance of this, which took place in Calabria, is mentioned by Sir C. Lyell. The upper stones of two obelisks in the convent of S. Bruno, in the town of Stefano del Bosco, were turned partially round, while the pedestals remained in their former position. A similar effect was noticed by Mr. Darwin in the cathedral of Concepcion, after the earthquake of 1835.

We have already stated that earthquakes originate most frequently in the bed of the ocean. A wave is then generated in the sea as well as the land. But the earth-wave travels faster than the ocean-wave. The former commences the destruction on land, which the latter arrives to complete. The ocean-wave created by the earthquake at Lisbon travelled to Barbadoes at the rate of 7·8 miles in a minute, and to Portsmouth at the rate of a little more than two miles in a minute. The speed of the earth-wave depends partly upon the nature of the strata through which it has to pass.

Earthquakes are generally preceded by loud rumbling noises. Sometimes such noises are heard

for a long period, without any earthquake occurring. When the earthquake originates in the sea, and is thence propagated to the land, the sounds, being propagated through three media of unequal transmissive power, produce a succession of different sounds. The sound travels through the bed of the ocean at the rate of from 7000 to 10,000 feet in a second, and arrives before, or at the same time with the earth-wave, giving rise to hollow sounds; through the ocean the sound travels at the rate of 4700 feet in a second; and through the air, at the rate of 1123 feet in a second. The two last give rise to a succession of rumbling sounds like distant thunder, and they precede the arrival of the ocean-wave.

The most extensive district where earthquakes occur is found in the continents of Europe and Asia, and has the Mediterranean as a centre; but they are most violent and frequent in the continent of South America; and it is a singular circumstance that, in that continent, they are bounded to the eastward by the Andean chain.

Most of the large towns on the western coast of South America have been destroyed at least once by an earthquake. But perhaps no one place has suffered so much from volcanic agency as the old town of Guatemala, in Central America. The first town of that name was destroyed by a rush of water from the volcano of Agua. In 1542, it was rebuilt; but shortly after, an epidemic, accompanied by earthquakes, carried off numbers of people. In 1565, 1575-6-7, disastrous earthquakes occurred. In 1586, the greater part of the town was reduced to ruins. In 1651, considerable damage was done; in 1717, still greater; till, in 1773, the whole town was destroyed. In addition to these misfortunes, serious epidemics occurred from time to time. At last the inhabitants left the place, and founded a town elsewhere. Nevertheless, Mr. Stephens found the old site repopled in 1839, and spoke to an old priest who had been witness to the last great catastrophe.

The town of Concepcion, in Chili, has been thrice destroyed by earthquakes. The first time was in 1730, the second in 1750, and the third on the 20th February, 1835.

It happened that H. M. S. Beagle entered Talcahuano (the port of Concepcion) two days after the last occurrence. Very interesting observations were made at the time, by Captain Fitzroy, the commander of the vessel, and by Mr. Darwin who accompanied the vessel during her five years' cruise, and whose Researches in Geology and Natural History during that period are in the hands of all those interested in scientific travels. Before the vessel had reached the port, abundant proof of a disaster of a formidable kind presented itself—"the whole coast," says Mr. Darwin, "being strewn over with timber and furniture, as if a thousand great ships had been wrecked." Mr. Darwin's subsequent impressions are given as follows:—

Both towns [those of Talcahuano and Concepcion] presented the most awful yet interesting spectacle I ever beheld. To a person who had formerly known the places, it possibly might have been still more impressive; for the ruins were so mingled together, and the whole scene possessed so little the air of a habitable place, that it was scarcely possible to imagine its former appearance or condition. The earthquake commenced at half-past eleven in the forenoon. * * * * In Concepcion each house, or row of houses, stood by itself a heap or line of ruins; but in Talca-

hano, owing to the great wave, little more than one layer of bricks, tiles, and timber, with here and there part of a wall left standing, could be distinguished. From this circumstance, Concepcion, although not so completely desolated, was a more terrible, and, if I may so call it, picturesque sight. The first shock was very sudden. The invariable practice among the residents in these provinces, of running out of doors at the first trembling, alone saved them. The mayor-domo of Quiriquina told me that the first notice he received of the earthquake, was finding both the horse he rode and himself rolling together on the ground. Rising up, he was again thrown down. He also told me that some cows, which were standing on the steep sides of the island [of Quiriquina], were rolled into the sea. The great wave, however, was far more destructive in this respect: on one low island near the head of the bay seventy animals were washed off and drowned. After viewing Concepcion, I cannot understand how the greater number of inhabitants escaped unhurt. The houses in many parts fell outwards; thus forming in the middle of the streets little hillocks of brickwork and rubbish. Mr. Rous, the English consul, told us that he was at breakfast when the first movement warned him to run out. He had scarcely reached the middle of the courtyard when one side of his house came thundering down. He retained presence of mind to remember that if he once got on the top of that part which had already fallen, he should be safe. Not being able, from the motion of the ground, to stand, he crawled up on his hands and knees; and no sooner had he ascended this little eminence, than the other side of the house fell in, the great beams sweeping close in front of his head. With his eyes blinded and his mouth choked with the cloud of dust which darkened the sky, at last he gained the street. As shock succeeded shock, at the interval of a few minutes, no one dared approach the shattered ruins; and no one knew whether his dearest friends and relations might not be perishing from want of help. The thatched roofs fell over the fires, and flames burst forth in all parts. Hundreds knew themselves to be ruined, and few had the means of providing food for the day.

Mr. Darwin thus describes the great wave, which was estimated to have a height of from sixteen to twenty feet:—

In the middle of the bay it was seen as one unbroken swell of the water; but on each side, meeting with resistance, it curled over, and tore up cottages and trees as it swept onward with overwhelming force. At the head of the bay it is easy to imagine the fearful line of white breakers which three times rushed over and almost obliterated the ruins of the former town. Pools of salt water yet remained in the streets; and children, making boats with old tables and chairs, appeared as happy as their parents were miserable.

It is noticed by Dr. Darwin, that the walls which ran in a direction south-west by west, stood the shock much better than those which ran at right angles to them. This observation is interesting as connected with the direction of the undulatory axis, which is shown, by this and other circumstances, to have been in a north-easterly direction. It has been remarked, on other occasions of earthquakes, that all the pendulums of clocks vibrating in one direction have stopped, while all those moving in an opposite direction have continued in motion. Thus the direction of the motion given to the earth's crust by an earthquake appears to be generally determined. It has been noticed that when an earthquake reaches the junction of less with more compact strata, having first passed over the former, a sort of reaction takes place, and the

ground is torn up and twisted in an unusual and most disastrous manner.

One of the most dreadful earthquakes on record is that which, on the 1st of November, 1755, destroyed the greater part of the city of Lisbon. The only warning the inhabitants received was a noise like subterranean thunder. When the event took place they were assembled in the churches. Six minutes sufficed to destroy sixty thousand persons.

On this occasion there appeared to be a great recession of the sea, and of the water of the Tagus in connexion with it; vessels in the river having suddenly found themselves aground. Probably the general impression was incorrect, and the effects were rather due to an upheaval of the bed of the river. Shortly after, the great wave swept in, having in this instance an elevation of fifty feet. To complete the work already begun, numbers perished also, by the subsidence of a quay on which they had assembled for security. This quay, which had recently been built, vanished below the waters, and nothing was afterwards seen of it or its freight. Numerous small vessels and boats sank at the same time, but, it is said, no fragments of the wrecks appeared again at the surface.

The earthquake of Lisbon was felt over an area of 700,000 square miles, or a twelfth part of the circumference of the globe. The West Indian isles on one side were affected by it; the lakes of Scotland, Norway, and Sweden, on the other. To the south it extended at least as far as the island of Madeira, and eastward, it was felt in Italy.

A series of convulsions in Calabria, which lasted nearly four years, began in 1783, with an earthquake which is only equalled by that of Lisbon. It did not extend, like the latter, over a great extent of country, but the effects it produced within its limited sphere were even greater. It lasted only two minutes, during which brief space it destroyed all the towns and villages within a circuit of twenty-two miles. Messina, also, was much injured by the shock.

The peninsula of Calabria Ultra, where the earthquake occurred, forms the southern extremity of Italy, is about sixty miles in length, and has a mean breadth of about twenty miles. Through the centre of the peninsula runs a chain of granite mountains, which is separated from the sea on its western side by a plain of recent strata, composed of very yielding material. The effect of the earthquake was to disconnect, throughout almost the whole length of this chain, the new with the ancient rock, leaving a chasm between them. One half of the peninsula, therefore, actually slid in the direction of the sea. From this fact alone it may be inferred that the havoc must have been. The geologist Dolomieu, who visited the district shortly after the event, says:—

When I first passed over to Calabria, and first beheld Polistena, the scene of horror almost deprived me of my faculties; my mind was filled with mingled compassion and terror; nothing had escaped; all was levelled with the dust; not a single house or piece of wall remained; on all sides were heaps of stones so destitute of form, that they gave no conception of there ever having been a town on the spot. The stench of the dead bodies still rose from the ruins. I conversed with many persons who had been buried for three, four, and even for five days.

It is stated by the Abbé Spallanzani, who visited Messina about five years after the catastrophe of

1783, that, dividing that city into four parts, two parts were levelled to the ground on that occasion, the third was half laid in ruins, and the fourth was greatly damaged. He observes that at the time of his visit, more than one half the city had been rebuilt, so that the people had left the temporary sheds in which they had been compelled to take refuge.

Earthquakes are sometimes accompanied by eruptive phenomena, but the matter ejected is generally superficial. Mud, sand, and stones, accompanied by vapor, smoke, fetid gases, and sometimes flame, are emitted from the crevices in the earth, which frequently close immediately afterwards, without leaving a trace of their existence. During an earthquake at the beginning of the last century, so much earthy matter (mixed with steam) rushed out from chasms near the town of Aquila, (at the northern extremity of the kingdom of Naples,) as to render the fields in the neighborhood unfit for cultivation for many years. Water also ascended from the same crevices to a great height. During the earthquake which destroyed Riobamba, in South America, a muddy mass containing charcoal, crystal of augite, and scales of infusoria, issued from a chasin. On another occasion, numerous hillocks resembling mud-volcanoes were thrown up, but sank again, leaving pools of water in their places.

Earthquakes are more powerful agents than volcanoes in modifying the surface of the earth. Large areas of land are raised to greater elevations or subside. Chasms are opened which are afterwards widened by rivers into large valleys. River-courses are filled up and lakes are formed. During the earthquake of Concepcion, the island of Santa Maria, seven miles long, and two miles wide, was raised eight or ten feet; and Mr. Darwin states it to be almost a certainty that it has risen four fathoms since the convulsion of 1751. In Cutch, a mound, fifty miles in length and several miles in width, was raised by an earthquake to a height in some places of ten feet. The mole of the harbor of Messina, which extended more than a mile in length, was entirely swallowed up in 1783, so that no vestige remained to point out where it once was.

The following is a list, in chronological order, of the principal earthquakes on record, with the number of persons estimated to have perished:—

EUROPE.

Date.	No. of persons killed.	
1693 . . .	100,000	{ Occurred in Sicily: the town of Catania and forty-nine other places were levelled to the ground. Lisbon. Calabria; 20,000 persons are said to have died in addition, from epidemics and other causes connected with the earthquake.
1755 . . .	60,000	
1783 . . .	40,000	

In the beginning of the present century, an earthquake occurred in the kingdom of Naples, by which 3274 persons are said to have perished, and 1615 to have been wounded.

ASIA.

Date.	No. of persons killed.	
1772 . . .	2957	{ Java. Japan Isles. Many towns are said to have been swallowed up.
1783 . . .	6000	

Date.	No. of persons killed.	
1819		{ Cutch. Very few lives were lost, but a great extent of country was elevated. Aleppo destroyed. The towns of Damascus, Acre, Tyre, and Sidon, suffered great damage, and Tiberius and Safet were destroyed. In the neighborhood of Mount Ararat.
1822		
1837	6000	
1840	1049	
AMERICA.		
1687		{ The town of Lima almost entirely destroyed. Jamaica. Great loss of life. Lacatunga and Hambato (in Quito) destroyed. The town of Guatemala greatly damaged. Aniquipa. Santiago much damaged, and Concepcion destroyed. The town of Lima, containing 40,000 inhabitants, destroyed. Concepcion destroyed. Great part of St. Domingo destroyed. Guatemala destroyed, with 8000 families. Quito greatly damaged, and Riobamba levelled to the ground. Caracas entirely destroyed. Copiapo destroyed. Copiapo again destroyed; Valparaiso, and other places in Chili greatly injured. Caracas greatly injured. Plain of Bogota. Many towns overthrown. Concepcion totally destroyed.
1692		
1693		
1717		
1725		
1730		
1746		
1751		
1770		
1773		
1797	40,000	
1812	10,000	
1819		
1822		
1826		
1827		
1835		

It thus appears that in the last 148 years fifteen great earthquakes have convulsed the western shores of South America, and in no case did they occur without the partial or entire destruction of at least one town. The average interval has been about ten years. Few earthquakes are recorded as having occurred in Africa, partly, perhaps, because that continent is yet but little known to Europeans. The great earthquake of Lisbon extended over the northern part of the African continent, and it is stated that a village, eight leagues distant from Morocco, was destroyed, with its inhabitants; eight or ten thousand persons having perished on the occasion.

Those who have had actual experience of earthquakes describe their sensations as being such as are given by no other events. Mr. Darwin remarks—"A bad earthquake at once destroys the oldest associations: the world, the very emblem of all that is solid, has moved beneath our feet, like a crust over a fluid; one second of time has conveyed to the mind a strange idea of insecurity, which hours of reflection would never have created."

Basil Hall* tells an amusing anecdote, which shows the sensibility of the Chilians with respect to the slightest premonitory symptoms of these catastrophes. He relates, that while passing the evening with a family residing at Valparaiso, and when the different members of the family were busily engaged, as is customary on such occasions—suddenly, "without any apparent cause, the whole party jumped up, and flew in the most frantic manner out of the house, screaming out Misericordia! Misericordia!—beating their breasts at the same time, and looking terrified beyond description."

* Travels in South America.

On reaching the street, it appeared that every one else, as if by the same impulse, had acted in a similar manner. The street was filled from end to end with persons, (some of them only half dressed,) in the same state of alarm and confusion. After standing in the street about a minute, every one entered his house, and the hubbub ceased as soon as it began.

How slight the shock which produced this strange scene was, may be known by the fact that, until informed to the contrary, Basil Hall believed that he was witnessing a religious ceremony; and, with the view, doubtless, of complying externally with the customs of the country, did not fail (he informs us) to add his voice to those of his friends, in invoking *Misericordia*.

The sensibility of the inhabitants of Lisbon to slight noises is to this day a joke against them.

The number of earthquakes which occur in the course of a year is not known. In some places slight shocks are almost of daily occurrence. Slight shocks are felt occasionally in England, and, with comparative frequency, in parts of Scotland.

Sometimes an earthquake is perceived at the bottom of a mine, when it is not perceptible on the surface. This is said to have been the case in England at the time of the earthquake of Lisbon. Sometimes the converse holds good. Fourteen earthquakes, in different parts of the world, are said to have occurred in 1827. Unless parts of Africa are an exception, there is, probably, no part of the globe which has not experienced an earthquake in a slight degree.

SOLFATARAS AND HOT SPRINGS.—The phenomena of solfataras and thermal springs are attributed to the same causes as volcanoes and earthquakes.

Solfatara, a word of Italian origin, is the name given to those mountains which exhale sulphureous vapors. They are considered to have formerly been active volcanoes. In one case, that of the solfatar of Puzzuoli, a volcanic eruption is said to have taken place from its crater within historical times. Solfataras are much less frequent than hot springs, and do not demand the same attention from the geologist. Their appearance, however, frequently excites attention, from the blanching nature of some of the gases evolved. The sulphuretted hydrogen and muriatic acid discharged from that of Puzzuoli, reduced the volcanic rock in contact with them to a siliceous powder. Sulphur is also deposited by the exhalations.

The connexion of hot springs with volcanoes is less evident than the similarity of solfataras and the latter, for hot springs occur abundantly in countries giving no sign at present of any volcanic activity. The majority of hot springs rise either from rocks of a volcanic nature, from mountain chains, or from points of disruption in strata. It has been remarked by Professor Forbes, who investigated the hot springs in the Pyrenees, (where they are very abundant,) that they occur almost invariably at the junction of the granitic with the stratified rocks. It is strong evidence of the connexion between hot springs and volcanic phenomena, that earthquakes and volcanic eruptions are known to have affected the temperature of such springs. After the occurrence of an earthquake between Bordeaux and Narbonne, the temperature of one of the hottest of the Pyrenean springs was so much reduced as to be no longer of any value. In the year of the great earthquake of Lisbon, another Pyrenean spring rose 75° in temperature. It is

mentioned by Humboldt, that when the eruption of Jorullo in Mexico broke out, the waters of two rivers, which previously existed on the site of the newly formed mountain, were lost, but at some distance two thermal springs made their appearance.

Hot springs are of all degrees of temperature between that of the surrounding air and boiling water; the flow of water is generally more abundant from them than that from cold springs. They (with few exceptions) discharge at all times the same quantity of water, and their temperature and chemical constituents remain constant. There is evidence to show that the temperature of some hot springs has not diminished during the last thousand years.

In Iceland, hot springs, known by the name of Geysers, are found capable of ejecting solid matter to a height of 200 feet or more. This occurs, however, only when the vents for the passage of aqueous vapor have been artificially closed. The peculiarity of the phenomena exhibited at the geysers merits a more particular description than other hot springs appear to require.

The large geyser is a nearly circular basin whose greatest diameter is fifty-six feet; its depth is about four feet. In the centre rises a tube, through which water is continually bubbling over into the basin; which process, however, is interrupted at short intervals by a sudden burst of water accompanied by a loud explosive noise. The central pipe is seventy-eight feet in depth and from eight to ten feet in diameter. The water of this geyser, when analyzed by Professor Faraday, was found to contain silica and a salt, probably of soda.

An ingenious explanation of the phenomena of the Icelandic geysers has been suggested by Sir C. Lyell. He supposes the pipe to communicate with the bottom of a reservoir into which steam also enters from crevices in the bottom, and water from the top. On this supposition, water would in the first instance collect at the bottom of the reservoir, covering both the entrance to the pipe and those which admit the steam. The steam, therefore, is condensed by contact with the water, and by parting with its heat raises the temperature of the water, which itself gives off steam, till the upper part of the reservoir is filled with steam of sufficient pressure to raise the water in the pipe. The steam, having now raised the water above itself, is enabled to escape through the water in the pipe, but should any artificial cause impede its rush through the pipe a violent explosion is the consequence. It is a common practice of travellers in Iceland to produce a violent movement of this kind by filling up a thermal vent with solid matter. It may be remarked, that the above suggestion of Sir C. Lyell is to be taken as indicating one of the possible ways in which the phenomena may be produced; and is not supposed to give the only explanation which is consistent with the observed phenomena.

Mud and air volcanoes seem to belong to the same class as solfataras and geysers. At Macalomba, in Sicily, there is a hill of dry mud, about 160 feet high. In its upper part are found a multitude of small cones not above a yard in diameter. These cones are full of soft clay, and large bubbles of gas escaping at every moment, with an exploding noise, scatter the clay around. Many similar objects occur near Modena.

There is little doubt, as we have already remarked, that the same general causes produce

volcanoes and earthquakes, smoking mountains and boiling springs. All these appearances, except earthquakes, are accompanied by heat, as one of their manifestations; they occur more frequently in volcanic regions than elsewhere; when hot springs occur in abundance in other districts, it is in those where violent earthquakes have occurred in comparatively modern times, or where much disturbance in the strata indicates such convulsions to have once been. The connection between earthquakes and volcanoes is quite certain, to the extent of slight earthquakes, and there is a general impression, as well as several striking facts, in support of a more extensive connection. It is said to be the general opinion at Naples, Messina, and Catania, that earthquakes are not to be dreaded so long as smoke escapes freely from the craters of Vesuvius and Etna. The same feeling prevails in Ecuador.

The inhabitants of the elevated valleys of Quito and Hambato, residing round the bases of the volcanoes of Tunguragua and Cotopaxi, dread the visitation of an earthquake, when for any length of time no smoke has been seen rising from their craters, and they are firmly convinced that the earthquakes which have so frequently proved destructive to their country will entirely cease as soon as the porphyritic cupolas of Mount Chimborazo shall have been removed, and thus a free exit been formed for the escape of volcanic matter or vapor.

It has already been remarked that earthquakes commonly precede volcanic eruptions. There are also facts connecting volcanic eruptions with earthquakes, even when they occur at great distances from each other. Facts of this kind, too numerous and too authentic to be discredited or attributed to accident, have occurred in South America. It is stated by Humboldt, that the volcano of Pasto, which for many months had uninterruptedly emitted a column of thick smoke, ceased to do so at the very moment that the table land of Quito was convulsed by the earthquake which destroyed the town of Riobamba. The distance in this case was 220 miles.

In the years 1811 and 1812, a succession of earthquakes was felt in the islands of the Columbian sea and surrounding continent, which extended northward along the Mississippi. They did not terminate till a great eruption of the volcano of St. Vincent, which had been dormant for a century, broke out. It is supposed that these events were connected with the throwing up of the island of Sabrina, at the Azores. It was also remarked on the 1st of November, 1755, the date of the great earthquake of Lisbon, that a whirling column of smoke ascended from the crater of Vesuvius, which suddenly stopped, the smoke which had issued being even said to have *reëntered* the volcano. The events recorded by Mr. Darwin as having occurred simultaneously with the destruction of the town of Concepcion, in 1835, are at the same time the most striking and most indisputable on record. Mr. Darwin remarks:—

Although it is known that earthquakes have been felt over enormous spaces, and strange subterranean noises likewise heard over nearly equal areas, yet few cases are on record of volcanoes very far distant from each other, bursting out at the same moment of time. In this instance, however, at the same hour when the whole country around Concepcion was permanently elevated, a train of volcanoes situated in the Andes, in front of Chiloe, instantaneously spouted out a dark column of smoke, and during the subsequent year

continued in uncommon activity. It is, moreover, a very interesting circumstance, that in the immediate neighborhood these eruptions entirely relieved the trembling ground, although at a little distance, and in sight of the volcanoes, the island of Chiloe was strongly affected. To the northward, a volcano burst out at the bottom of the sea, adjoining the island of Juan Fernandez, and several of the great chimneys in the Cordillera of Central Chili commenced a fresh period of activity. We thus see a permanent elevation of the land, renewed activity through habitual vents, and a submarine outburst, forming parts of one great phenomenon. The extent of country throughout which the subterranean forces were thus unequivocally displayed, measures 700 by 400 geographical miles.*

From these and other considerations, Mr. Darwin is of opinion that the conclusion can scarcely be avoided, that "a vast lake of melted matter, of an area nearly doubling in extent that of the Black Sea, is spread out beneath a mere crust of solid land." Humboldt entertains a similar opinion regarding another portion of South America:—"The whole plateau of Quito must," he says, "be regarded as a single volcanic surface." These remarks naturally lead to a consideration of the different theories which have prevailed to account for volcanic phenomena.

It must be premised, that in discussing this question the geologist finds little to assist him in the truths which belong especially to his own science. It is the business of the geologist to explain the physical appearance of the globe so far as inorganic nature is concerned, and so far as it is due to mechanical causes. If he steps beyond these limits he must borrow from the astronomer, the chemist, or the naturalist, the data on which his reasonings are founded. The sciences are mutually dependent on each other, and many of the most interesting inquiries require the aid of several; but in discussing these questions it is useful to bear in mind how much of the result is due to each science, in order that the strength of each link of the chain may be separately valued. A geologist, for instance, is bound to be fully acquainted with his own science, but he is not equally answerable for the truths of other sciences. When, therefore, he undertakes to theorize beyond the pale of his science, he is bound to show clearly how many of the data rest on the independent basis of his peculiar science. Had this course been pursued by the many theorists who since the infancy of geology have speculated on the changes in the structure of the globe, it is probable that many rash conclusions would have been avoided. It is only when the truths of different sciences are kept apart that they can confirm each other. When no accurate distinction is made, the mind is apt to reason in a circle, by making the doubtful conclusions of one science confirm those of another, while the latter again are appealed to in support of the former.

The existing theories of the internal condition of the globe have been contributed by the astronomer and chemist, but the theories which they have suggested have been scrutinized in the departments of geology and general physics, and more is being

* Mr. Darwin elsewhere remarks, that the area here given is understated. The reader may be reminded that the eruption of Coseguina, already detailed in the text, occurred on the same day as the earthquake of Concepcion. This volcano is distant 2700 miles from the sites of eruption mentioned by Mr. Darwin.

done every day in the latter sciences towards testing old theories and originating new.

The prevailing doctrine at present appears to be that which was suggested in the first instance by Leibnitz. It was remarked by that philosopher that the form of the earth is the same which it would have assumed if, with the existing laws of motion, it had originated in a fluid state.

Putting together this fact with that of the system of fluid rock from the interior of the earth, the hypothesis was started, that our planet was originally a burning luminous mass which has been in process of refrigeration since the time of its creation. According to Leibnitz, a universal ocean was formed, as soon as the cooling process commenced, by the condensation of the vapors. Subsequently the ocean subsided through rents in the crust, having first deposited the matter which it held in solution.

On this hypothesis volcanoes and earthquakes are due to convulsions produced by the refrigerating process. The astronomical theory of Sir W. Herschel gave additional weight to the view of Leibnitz.

It was supposed that the gradual formation of certain heavenly bodies by the condensation of nebulous matter, could be actually seen by means of the telescope. If this nebulous matter were not itself of a high temperature, heat would necessarily be developed by its condensation. The recent discoveries by means of Lord Ross' telescope, however, have obliged astronomers to abandon the idea that nebulous matter could be distinguished as distinct from clusters of stars.

The theory of Leibnitz must, therefore, so far as astronomy is concerned, rest solely on the evidence which the earth's oblate sphericity affords. But the natural philosopher has taken the theory up at this point, and has adduced evidence both for and against the hypothesis. On the supposition that the earth is in process of refrigeration, it would follow that from the point below the surface where fluidity commences to the centre, the earth would be in all directions a hot fluid mass. Now, it has been remarked, that in descending from the surface towards the interior of the earth, the temperature gradually increases. Experiments have been made in many parts of Europe, and in all cases the increase of temperature was decided, though it varies not only in different countries, but in different parts of the same country. The mean ratio is stated by some at 1° Fahrenheit for a descent of 60 feet, and at 1° Fahrenheit for every 45 feet by others. Arguing from these facts, it has been shown that at a depth of 35,000 feet there would be a temperature of low red heat, and at a depth of twenty-four miles the melting point of iron would be attained. The hypothesis has thence been extended to forming estimates of the temperature of the centre of the globe, but even if it were proved that throughout the surface of the globe the temperature increased with the depth we descend into its interior, and admitting that this points to the fact that there is matter at some distance below the surface more heated than the matter at the surface; the facts do not afford the slightest ground for concluding this temperature to be a high one. If we assume that the temperature has been found to increase at the rate of 1° Fahrenheit for every 45 feet as low as the bottom of the lowest mine—say 2000 feet—we attain a temperature of 44° above that of the atmosphere; if we reckon the latter at 60° we have at the bottom of the mine a tempera-

ture of 104° . Now these facts, supposing them to be universal, clearly admit of explanation, without supposing the entire central mass of the earth to be, as some reasoning from the data have supposed, a fluid of the enormous temperature of 450,000°. It would meet the case to suppose the remainder of the earth to have that very temperature. And if the heat of fluid lava be adduced, to show that a much higher temperature exists—an evidence which cannot be denied—still we need not go beyond the facts in our theories. At the rate of 1° for every 45 feet, we should, at a depth of twenty-five miles, attain a heat sufficient to melt almost every known substance. Beyond this temperature the evidence does not require us to go. There remain 3975 miles in the earth's depth, the condition of which is an open question.

But there is strong reason for believing that throughout three fourths of the earth's superficies, the temperature does not follow any such law of increase as has been proved to take place in certain parts of Europe, and that over large areas the temperature diminishes as you descend.

From observations made by Kotzebue, Beechy, and Sir James Ross, "the extraordinary fact has been established, almost beyond a doubt, that the deep sea-water, below a certain level determined by the latitude, is of one invariable temperature throughout the globe, and that temperature a very low one; the calculations of Lenz, founded on Kotzebue's results, giving 36° Fah., and those of Ross, 39° 5'. The depth at which this temperature is attained, according to the latter authority, is 7200 feet at the equator, diminishing to 56° 26' south lat., where it attains the surface, and the sea is of equable temperature at all depths. Thence, again, the upper surface of the uniform substratum descends as the latitude increases, and at 70° has already attained a depth of 4500 feet. Similar phenomena would appear to occur in proceeding from the equator northward, the circle of constant temperature being repeated nearly in the same latitude. Thus the ocean is divided into three great regions—two polar basins, in which the surface temperature is below, and one medial one, in which it is above 39° 5'."* It thus appears that the facts which have hitherto been established regarding the temperature of the earth at certain depths below the surface, afford no evidence for supposing that the interior of the globe is a fluid mass of great heat. Investigations of a profounder nature have been undertaken by M. Fourier, the well-known French philosopher, which have led him to highly interesting conclusions, some of which are now generally accepted by competent judges.

M. Fourier has come to the conclusion that the actual temperature of the earth must be due to three causes—the sun's rays, the primordial heat of the earth, and the heat of the celestial spaces. "The mathematical theory of Fourier," says M. Comte,† "has clearly shown that the temperature at the surface of the earth would differ extremely from what it is observed to be, both in actual and relative amount, were not the terrestrial mass penetrated by a heat peculiar to itself; which heat tends to diminish by radiation from the crust of the earth. This original heat contributes very little directly towards the actual temperature of the surface,‡ but

* Review of Humboldt's *Cosmos*, in *Edin. Review*.

† *Cours de Philosophie Positive*.

‡ It is calculated that it does not raise the thermometer $\frac{1}{10}^{\circ}$.

It prevents its periodical variation from following other laws than those resulting from the solar influence, without which the greater part of the latter would be lost by dispersion throughout the mass of the earth."

M. Fourier has also "*endeavored*," says Sir C. Lyell, "by profound mathematical calculations, to prove that the actual distribution of heat in the earth's envelope is precisely that which would have taken place if the globe had been formed in a medium of a very high temperature, and had afterwards been constantly cooled." He has also shown, by reasoning from the conducting powers of the crust of the earth, that the present temperature of that crust is not inconsistent with supposing the central parts to have a very intense heat. To this reasoning, however, it is objected by Sir C. Lyell, that in liquids, heat is communicated throughout the mass by the formation of currents, and not by conduction, which is a much slower process.

In addition to these facts, all of which tend to throw light on the internal condition of our globe, it has been proved, by a comparison of the attractive power exercised by the earth with that exercised by small bodies of known weight, that the mean density of the earth is $5\frac{1}{3}$ times that of water. Now, the mean density of the crust of the earth, so far as we are acquainted with it, is between 2.7 and 2.9. It is clear, therefore, that the density of the earth increases towards the centre, attaining a density much superior to that of basalt, which is about 2.6, or to that of modern lavas.

Now, it is capable of proof, that matter of the same density as the external crust of the earth would be so much heavier (owing to condensation) at the centre of the earth, as to make the whole density of the earth much greater than it actually is. At a depth of 362 miles, water, for instance, would have the density of mercury. The natural inference would be, that the interior of the earth is composed of matter which would be much lighter at the surface of the earth than the matter now found there. But, on the other hand, it has been rendered probable, by certain astronomical observations on the motion of the moon, that the density of the earth increases symmetrically from the surface towards the interior, whence it is concluded that the interior of the earth must have been composed of matter at least as dense, originally, as that of which the surface is composed. The solution of this difficulty is supposed to be found in the internal heat of the earth, which counteracts the condensation due to pressure.

The school of geologists which has embraced the doctrine of primordial fluidity and gradual refrigeration, appeal to certain facts within the pale of their science as being confirmatory of this doctrine. It is urged that the "general floor" (as it has been called) of the earth's crust is composed of rocks, which, from their resemblance in mineral compositions to rocks known to be of igneous origin, and from the absence in them of organic remains, are in all probability themselves due to igneous causes. Moreover, it is alleged that the appearance of the earth's crust indicates that it has passed through successive periods of unusual convulsion and comparative repose; a state of things which would be a corollary from the addition of a mass of heated matter slowly undergoing refrigeration.

The remains of organic life are also pointed to as showing that, in the past history of the earth, certain extra-tropical regions must have possessed the climate of the tropics.

On the other hand, it has been attempted, by a different school of geologists, to explain these phenomena by means of other causes, and if not with perfect success, it will readily be admitted, that, unless the doctrine of central fluidity and gradual refrigeration were supported by other evidence, it could not stand on the evidence of the geologist alone.

The following appears, then, to be a summary of the evidence in favor of the earth's being at present in a state of fusion. The form of the earth suggests the idea that it formerly existed in a fluid state, which fluidity may, with greater probability, be attributed to igneous than to aqueous causes. Now the frequent discharge through its crust, in former and in present times, of matter in a state of fusion, is so far evidence in favor of the hypothesis, as to render almost certain the existence, in various parts of the globe, of large areas of heated matter, at a depth of some miles below the surface. It also appears to have been clearly made out, that the earth has a temperature independent of solar heat, and somewhat greater than it could derive from that source alone. There is nothing in the present temperature of the surface of the earth or its interior (as known by direct observation) *inconsistent* with supposing the original fluidity of the earth to have continued to exist below the surface, accompanied by heat of the intensity required to retain it in a state of fusion. This is only a negative argument. Should M. Fourier's investigations into the natural distribution of an intense central heat over the surface of a mass resembling the earth, be confirmed by further inquiries, it would be strong positive evidence in favor of the actual existence of the high degree of central heat supposed.

A different theory to account for volcanic phenomena is that which attributes these phenomena to chemical changes going on in the crust of the earth. When Sir H. Davy discovered that earths and alkalis had metallic bases, which generate great heat in combining with oxygen and forming those substances, it was suggested by him that the central parts of the earth might have a predominance of these metals, and that volcanic phenomena might be due to the chemical changes which they would undergo as they approached the surface, and came in contact with the oxygen contained in water. This ingenious speculation has not met with general acceptance, though it has been warmly supported by Dr. Daubeny, and others. Sir C. Lyell, who is a firm advocate for some chemical or electrical origin of volcanoes and earthquakes, and a decided opponent of the theory of central heat, thinks it probable, in accordance with a suggestion of Professor Daniell, that a circle of chemical changes may be kept up by the reconversion of the earths and alkalis into their metallic bases. This deoxidizing agency is attributed to hydrogen, which it is supposed would be formed in immense quantities during the oxidization of the metallic bases in the first instance.

Whatever be the true state of the interior of the globe, whether it be entirely fluid, or the fluidity exist only in certain parts, an inquiry of much interest arises: a notice of which, though it does not enter directly into an account of existing volcanic action, will not be out of place.

Has the surface of the earth acted on by the supposed fluid been subjected to sudden and violent paroxysms, which have produced mountain chains at one stroke, or have the irregularities of the crust been produced by less violent but more fre-

quent efforts? If the latter, then the changes which are now observed to accompany volcanic eruption and earthquakes may be part of a series by which immense chains of mountains, like the Andes and Himalayas, have been produced. The inquiry in question has given rise to much discussion on the part of geologists. The view taken by those who hold the doctrine of primitive heat and gradual refrigeration has already been stated. Those who hold the contrary opinion derive much support from observations made on the Andes in South America, of which those of Mr. Darwin were not the least important. It has already been stated, that during the earthquake which occurred in Chili, in 1835, a large extent of land was raised several feet. Still more striking evidence of a rise of land was observed by Mr. Darwin in the neighborhood of Mendoza, on a ridge of mountains running parallel with the chain of the Andes. At a height of 7000 feet Mr. Darwin discovered a number of silicified trees rising from a bed of submarine lavas and sedimentary matter. These he supposes to have once flourished by the shores of the Atlantic Ocean, now distant 700 miles. Subsequently they must have been buried beneath the ocean, where they were covered not only with sedimentary matter, but, (as Mr. Darwin infers from their present position,) by enormous streams of lava alternating with the aqueous deposits. Finally, these same trees, now in a siliceous state, were raised to their present position, where they have been exposed to view by the detrition of the rocks in which they were embedded. The rise of land which occurred during the earthquake of 1835, is supposed by Mr. Darwin to be one in a series of elevations by which the whole west coast of South America has been raised above the level of the sea. He considers earthquakes to act in a manner precisely analogous to volcanoes, in the one case melted matter being pumped into crevices occurring in the under surface of the crust, in the other the same matter being ejected. It is further suggested by him that the immediate cause of the interior convulsion is the giving way of the strata superincumbent on the sea of melted matter which, as we have already seen, he supposes to be spread out beneath the surface. The subsidence may be due to the tension produced by previous injections.

This theory of the gradual elevation of a chain of mountains is the only one, Mr. Darwin remarks, which will explain the fact that the axis of such chains has become solid under a pressure which the superior strata could not have exercised in their present inclined or vertical positions.

Closely connected with the subject of the elevation of mountain chains by means of earthquakes, is the inquiry whether volcanoes exercise a similar power, or produce elevation merely by the accumulation of the products which they eject.

The result of Von Buch's investigations into the geology of the Canary islands, was to convince him that some of the volcanic mountains in those islands owe part of their elevation to a distinct elevating force acting beneath the surface, and he was led to the conclusion that some of the crateriform depressions are not craters of eruption, but depressions due to the elevation of the surface from below. These craters were therefore called by him "craters of elevation." Much has been written for and against this doctrine, particularly with reference to appearances in the extinct volcanic region of Auvergne. The most striking facts in regard to the elevation of land are those, however, which relate

to the volcanic islands of the Pacific Ocean. The discovery of marine shells and fringes of dead coral on these islands, at various heights above the sea, has shown that for a long time they have been rising gradually above the ocean; but, to add to our surprise, it is highly probable that the coralline islands, comprising all the non-volcanic islands, are gradually subsiding. The two phenomena go on in distinct parts of the ocean, no volcanic island existing within the areas of subsidence. The gradual change of level, which takes place on a large scale in parts of the ocean which are not subject to volcanic eruptions or earthquakes, is perhaps no less remarkable.

There is a line, (says Mrs. Somerville,)* crossing Sweden from east to west in the parallel of 56° 3' N. lat., along which the ground is perfectly stable, and has been so for centuries. To the north of it for 1000 miles, between Gottenburg and North Cape, the ground is rising, the maximum elevation, which takes place at North Cape, being at the rate of five feet in a century, from whence it gradually diminishes to three inches in a century at Stockholm. South of the line of stability, on the contrary, the land is sinking through part of Christiansad and Malmo; for the village of Stapten, in Scanea, is now 580 feet nearer to the Baltic than it was in the time of Linnaeus, by whom its distance was measured eighty-seven years ago. The coast of Denmark on the Sound, the island of Saltholm, opposite to Copenhagen, and that of Bornholm, are rising, the latter at the rate of a foot in a century. The coast of Memel, on the Baltic, has actually risen a foot and four inches within the last thirty years, while the coast of Pillau has sunk down an inch and a half in the same period. The west coast of Denmark, part of the Feroe island, and the west coast of Greenland, are all being depressed below their former level. In Greenland, the encroachment of the sea, in consequence of the change of level, has submerged ancient buildings on the low rocky islands, and on the main land. The Greenlanders never build near the sea on that account, and the Moravian settlers have had to move inland the poles to which they moor their boats. It has been in progress for four centuries, and extends through 600 miles from Igalito Frith to Disco Bay.

It has also been shown that the land is rising in parts of Scotland.

VOLCANIC PRODUCTS.—Some examples of the different forms in which matter is brought to the surface by volcanic eruptions have already been given. The matter found in the neighborhood of volcanic mountains consists generally of one of three classes. It is either lava, scoriae, or tufa. Lava is a dense homogeneous mass, which has not been thrown up into the air, but has flowed from the crater in a uniform stream. There are many varieties of lava—varieties in structure, form, and color.† Some lavas are heavy and compact: others are light and porous. They are sometimes argillaceous, and often vitreous. The rock on which the castle of Lipari is built is composed of lava, which has partly passed into the vitreous texture. Lipari generally abounds in vitreous lavas. Obsidian and (probably) pitchstone are vitreous forms of lava, but do not often occur in the products of modern volcanoes.

Lava is generally of a dark color, but it is found of all colors, from almost white to nearly black. It is sometimes found of a beautiful red color.

* Physical Geography.

† The varieties of lava mentioned in the text are almost exclusively those which have been found in the Italian region of active volcanoes.

The forms of lava are few. It is generally amorphous—that is, without any particular form—but occasionally modern lava, like basalt, assumes a primitive outline.

Very curious changes take place in lavas which, like those surrounding the crater of Solfatara, are exposed to the action of decomposing vapors. They are frequently reduced to the state of powder, and their color becomes quite white. The following varieties are mentioned as occurring in Solfatara. 1. A light lava, having the color of blue baked brick, of a coarse, earthy grain, and argillaceous odor. 2. Of a cinereous color, containing iron pyrites. 3. An extremely white lava, almost reduced to powder, containing pyrites in layers. 4. A heavy lava, of a livid gray, abounding in pyritic crystals. 5. A lava white on the surface and reddish blue in the interior.

A peculiar kind of rock, known in Italy as *breccia*, is sometimes found in the neighborhood of volcanoes. It consists of angular fragments of different kinds of lava cemented together. It is often of various and very beautiful colors. The following kind is found in large isolated masses on the island of Lipari; its principal substance is an earthy lava of a bluish gray, coarse grain, and little hardness. It contains—1, lavas of a black and gray color; 2, a vitreous lava of a beautiful color, between green and blue, resembling pitchstone; 3, numerous small pieces of a cinereous, compact pumice; 4, pieces of whitish, semi-transparent glass; 5, small pieces of a colored glass, resembling fictitious glass.

The number of minerals which are found in small quantities embedded in the lavas of Vesuvius is very numerous. Garnets occur frequently in some of its lavas.

Scoriae, so called from their analogy to cinders, are found in masses of small diameter, of a very rough exterior and porous structure, as if they had been pervaded by gas. In other respects they resemble lava, and they are, no doubt, portions of heated lava broken off from the general mass, either before it issues from the crater, or whilst it is cooling.

Scoriae sometimes assume a pear-like shape, when they obtain, in Italy, the name of *bombes*, or tears. At other times they have the appearance of twisted cables, trunks of trees, icicles, and other objects. They are found in Stromboli interspersed with beautiful colored crystals; some of the crystals being of a fine grass-green, others of an emerald color, and some a mixture of green and yellow.

When acted on by decomposing vapors, they undergo similar changes to lava; they lose their color, become encrusted with sulphureous matter, and are rendered so soft that they may be cut with a knife. Pumice is supposed to be the scoriae of the glassy lava called obsidian. It occurs abundantly on the Lipari islands and in the Santorian archipelago.

Tufa is a name given by the Italians to a rock, generally of an earthy texture, composed of an agglutination of scoriae and other loose products of volcanoes. It occurs abundantly (the product, of course, of extinct activity) in the neighborhood of Rome, where two varieties—known as stone and granular tuffs—are found. Stone tuff is of a reddish-brown color, with orange streaks. It occurs in beds from one to six feet thick, intersected by vertical or sloping clefs. The summits of the

Tarpeian rock and of the Aventine and Celian hills are composed of this rock, which was used by the Romans for building purposes.

Granular tuff is very different in external appearance from stone tuff. It is of a blackish-brown or yellowish-brown color, and of a much more earthy character. It sometimes assumes a clay-like aspect, and in this form is used for making bricks and earthenware. The Pincian, Quirinal, Viminal, and Esquiline hills, and the greater part of the Celian and Aventine, are composed of a peculiarly friable variety of granular tuff.

With the exception of Vesuvius, the greater part of the Phlegreæan fields are composed of tuffaceous rock. Naples is founded on tufa, and that rock is used as material for its buildings. The surrounding plain is tufa, and the hills to the north and west. The craters of the lakes Agnano and Averno, parts of Solfatara, Monte Nuovo, the promontory of Misenum, and the island of Bocca, are of this material. Herculaneum was destroyed by a tuffaceous torrent. Tufas are sometimes formed almost entirely of pumice, and not unfrequently contain organic matter. The sand and ashes which are thrown out in such enormous quantities during volcanic eruptions, may be classed under tuffaceous rock. The fragments of which they are composed frequently become bound together after their fall.

All lavas contain iron, distributed in small quantities throughout its mass. Occasionally this iron appears to be expelled, and is found crystallized in vertical plates. The most remarkable example of this process is in Stromboli. When examined closely the plates are seen not to be plane surfaces, but to have a polygonal form. The faces of the polygons are of different sizes. The largest exceed four inches in length, and three and a half in breadth. They have the brilliancy and polish of the finest steel, and reflect the light like the most perfect mirror. In a similar manner, globules of iron are sometimes found adhering to the external surface of lava. In the island of Ischia, and in other places, a ferruginous sand is found, in which the iron has a crystalline form. It occurs most abundantly by the sea-shore, and probably proceeds from the gradual wearing down of lava. Volcanoes sometimes eject masses of rock which do not appear to have undergone fusion—at least, recently. Thus Jorullo threw out fragments of granite; granular limestone is found in Sumatra.

Having mentioned the external forms of volcanic products, it remains to mention their internal structure.

The minerals feldspar and augite (the latter being probably identical in chemical composition with hornblende) compose the greater part of the igneous rocks of all ages. Modern lavas have been classified as trachyte, greystone and basalt, according as one or other of these two minerals predominates in them. In the trachytic lavas, feldspar is in greatest quantity. In the basaltic, augite. Greystones are an intermediate class, which contain the two minerals in about equal proportions.

Though volcanoes acquaint us with many new combinations of minerals, they have not added to the number of elementary substances. When reduced to their ultimate constituents, volcanic rocks are found to consist of the same matter as stratified rock. The following are the chemical analyses of feldspar and augite:—

Common Felspar.		Augite, from Etna.	
Silica,	64·0	Silica,	52·0
Alumina,	18·9	Alumina,	3·3
Lime,	0·8	Lime,	13·2
Potash,	13·7	Magnesia,	10·0
Oxides of Iron and		Oxides of Iron and	
Manganese,	0·7	Manganese,	16·7
		Water,	4·8
	98·1		10·00

Of these minerals, therefore, silex constitutes more than half the weight. The analysis of the compound rocks shows that, in passing from the trachytic to the basaltic kind, the quantity of silica gradually diminishes. We give below the analysis of obsidian, (a trachytic lava,) of a greystone lava, and of felspar:—

Obsidian.		Greystone.		Basalt.	
Silica,	78·	81·	44·50		
Alumina,	10·	19·	16·75		
Potash,	6·				
Lime,	1·	10·	9·50		
Magnesia,			2·25		
Soda,	1·6	4·	2·60		
Oxide of Iron,	1·0	14·	20·		
Oxide of Manganese,			0·		
Water,		1·	2·		
	97·6	99·	97·72		

It will afford an interesting comparison, both with these analyses and with each other, if we now place side by side the analyses of granite and pumice:—

Granite.		Pumice.	
Quartz, 2 parts; Felspar, 2 parts; Mica, 1 part.			
Silica,	74·84		77·5
Alumina,	12·80		17·5
Potash,	7·48	Potash and Soda,	3·0
Magnesia,	0·99		
Lime,	0·37		
Oxide of Iron,	1·93		1·7
Oxide of Manganese,	0·12		
Fluoric Acid,	0·21		
	98·74		99·7

It thus appears that, taking equal weights of granite and pumice, they give nearly the same chemical constituents. A striking resemblance is also perceived between the constitution of modern lavas generally and that of granite. Trachytic and basaltic lavas of ancient date are found, in some cases, to have penetrated granitic rocks, and in those cases must have originated below the granite. The date of these lavas, which are the earliest of which we have cognizance, is assigned as that of the appearance of the earliest tertiary rocks. But we must not extend these observations further, nor should we have extended them so far, had we not found that it was scarcely possible to give completeness to our sketch of this comprehensive and interesting theme within narrower limits.

BURNING WASTE OF CLACKMANNAN.

TO THE EDITOR OF THE TIMES.

SIR—The public will, I feel sure, be deeply interested in an experiment on a gigantic scale which has just been brought to a satisfactory conclusion under the superintendence of Mr. Goldsworthy Gurney. The object of the experiment was to extinguish a fire in the South Sauchie colliery, near Alloa, about seven miles from Stirling, which has raged for about thirty years over an area of twenty-

six acres, in the waste of the nine-foot seam of coal.

It is supposed to have been set fire to by some persons who had been distilling illicit whisky in it. Shortly after its discovery it rapidly extended itself, and threatened the destruction of the entire coal-field. A sum of £16,000 was laid out in surrounding the fire with a puddle-wall, to prevent its extending to other workings. The wall took five years in building, the workmen being frequently driven back, and obliged to recommence at a greater distance from the fire. It was, however, finally completed nineteen years ago. In the building of this wall the lives of nine men and three women were unfortunately lost at various times by the roof falling down and cutting off their retreat, and the fire overwhelming them before they could be excavated. One unfortunate girl was enclosed in this manner and not burnt, but roasted to death, so that, to use the expression of those who found her, when they took hold of her arm to lift her it came off like the wing of a roasted fowl. The fire having taken place near the crop of the coal it was surrounded by running the wall from the crop in a form resembling nearly a semicircle towards the dip, and then round again towards the crop, so that the line of the crop formed the diameter of the circle.

Still, however, the wall required constant attention; as, if the fire once passed it, it would be a matter of great difficulty and expense again to surround it. In consequence it has cost the owner of the property (the Earl of Mansfield) about £200 a year in keeping it up, and in the payment of overlookers, there being always a danger of the fire getting, by some accident, such as a fall of the roof, beyond the wall into the lower wastes, and burning the extensive coal field below. Various reports have from time to time been made by men of great authority in the coal trade, all of which have agreed in the utter impossibility of extinguishing this fire. It will, nevertheless, readily occur, that if the fire was thus, as it were, corked and bottled up to itself, it ought to have gone out from want of air. This, however, was not the case, for no part of the fire mine being deeper than twenty fathoms, and some of it running at no great distance below the surface, it obtained a sufficient supply of air thence, as well as through the leakages in the puddle-wall, to maintain a smouldering, sulky, and volcano-like existence—sometimes more active, and sometimes less so, which could be traced by occasional falls of the surface, the last of which occurred about five months ago, laying bare the burning waste and discharging smoke and steam.

There are about twenty-one old shafts into this fire mine, most of them partially filled. Some of them were sunk for the purpose of giving air to the workmen when building the puddle-wall, and some are old working shafts. There is also a drift running in a slanting direction from the crop, which was a clear passage for about sixty yards, and was then partially stopped by falls of the roof, but through which there was sufficient opening for air to pass into the mine. This drift served for an up-cast. Near to the wall was a shaft, at the opposite side of the burning waste, which, in this experiment, served as a downcast into the waste.

Lord Mansfield's attention was called by the members of the committee of the House of Lords, who sat in 1848 to consider the best means of preventing accidents in coal-mines, to the evidence then before them of the fact of a burning coal-mine

at the Astley Collieries, Lancashire, having been extinguished by the singular process of pouring in choke-damp, suggested and carried out by Mr. Gurney, a report of which, in a letter dated the 30th of April, 1849, appeared in *The Times* of the day—a fact so difficult to believe, and apparently impossible, that it was not generally credited, except by men of science. Lord Mansfield communicated with Mr. Gurney, who inspected the fire mine immediately after the rising of the committee of the lords, accompanied by Mr. Mather, the honorary secretary of the South Shields commission, Mr. Darlington, the proprietor of the Astley Colliery, and Mr. Jamieson, sheriff clerk of Clackmannan. After this inspection Mr. Gurney reported to Lord Mansfield that, notwithstanding the immense extent of the burning waste, he thought it possible to extinguish the fire; and, extraordinary as it may appear, this object has been effectually accomplished by a simple and inexpensive process.

We are accustomed to judge of great things by small, and, as a popular illustration, all the world knows practically that putting on an extinguisher puts out a candle; but perhaps few have taken the trouble to consider why it does so. It is simply that the extinguisher contains a very small quantity of air, of which about one fifth is oxygen, and the rest nitrogen. As soon as this oxygen is consumed, which in so small a quantity of air as the extinguisher will hold is almost at once, nothing remains to support combustion, and the candle goes out; for the extinguisher then contains only the nitrogen of the air and carbonic acid, the product of the combustion of the candle, which mixture of nitrogen and carbonic acid is chokedamp. It is, of course, obvious that if the fire mine could have been similarly treated it would have extinguished itself by the products of its own combustion, as in the above case of the candle, and as is often the case in coal-pits. The difficulty was that another element would come into the problem, which was, that supposing the mine to be placed under an extinguisher, (almost an impossibility, considering its size,) and all combustion to have ceased, still the magazine of heat collected during so many years' burning would continue, and cause the mine to reignite on the readmission of the air.

Mr. Gurney's method of effecting this object was to force a stream of chokedamp through the mine, by means of the high-pressure steam jet, at such a temperature as would, after putting out the fire, cool down the mine below any degree of heat that would permit it to reignite on the admission of atmospheric air, and at such a pressure as to make all the leakages of the waste outwards of chokedamp, so that every inlet might become an outcast by means of which the atmosphere was perfectly excluded from all contact with the fire.

Hot and cold are comparative terms. The heat of boiling water, though much too hot for the hand to bear, is much too cold to set fire to coal. If, then, a stream of chokedamp at or below this degree of heat were passed through the mine it would gradually carry off the heat of the lately burning surfaces, a process which one may term the abstraction of heat. It also happens that when different parts of a limited space are of different degrees of heat their tendency is to equalize the temperature of the whole, and a general diffusion takes place; that is, the cool parts become hotter and the hot parts cooler; and this is effected by an internal self-circulation of the air or gas with which

the space is filled, both of which principles were recognized and acted on during the process of cooling, a process which Mr. Gurney considered of great importance. In conversation with him on this point, previous to his leaving town, I made a suggestion which he was pleased to consider important, and at his request I accompanied him to the field of action, and was present during the conflict with our underground antagonist.

About the end of March Mr. Gurney, accompanied also by Mr. Mather and Mr. Jamieson, commenced operations. The machinery for conducting the experiment consisted of a high-pressure steam-boiler, about sixty feet of inch gaspipe, and a small cone for the high-pressure steam-jet at the end of it, which jet was placed at the proper striking distance from a cylinder of sheet-iron one foot in diameter and about nine feet long. The cylinder was the passage between a coke furnace and the downcast shaft, through which the air was driven by the force of the steam-jet, and, by a simple contrivance, we were able to blow in either the air passed through the furnace, or fresh, at pleasure. Mr. Mather and Mr. Jamieson descended this shaft, accompanied by three or four workmen, Mr. Gurney blowing them in fresh air from above, and there cleared away two old iron doors into the waste, and knocked a hole through an old puddle-wall, and then, hearing a good deal of rumbling and rushing, as if the roof were falling, they thought it more prudent to retreat, as they had effected their object of opening a passage for the gases into the burning waste. They, however, had spent some time in close proximity to the fire, where Mr. Mather seemed to be quite happy and in his element; indeed, he has a particular taste for fire. He came up one of the pits one day with a hot cinder stuck in his gutta percha mining cap and half melted through it. The heat at the bottom of this shaft was 100° at this time. These obstacles having been cleared away and a free passage obtained, the shaft was covered with iron plates and clayed over, so as to render it air-tight, and the chokedamp was turned on. That extinguishing gas was made by passing the atmospheric air through an intense coke fire in a brick furnace, which deprived it of all its oxygen, or rather the oxygen combined with the carbon of the coke, and formed carbonic acid, which gas, in mixture with the nitrogen left, was forced through the furnace, along the iron cylinder, down the shaft, and into the burning waste; the quantity of coke consumed being a sufficiently accurate measure of the quantity of air passed.

After blowing in about 8,000,000 of cubic feet of chokedamp, (at the rate of about 7,000 cubic feet per minute,) which we calculated to be about the contents of the waste, (allowance having been made for falls of the roof,) we found the upcast or high level shaft or drift was full of it to the mouth, flowed over, and ran along the ground, extinguishing lights if held near the surface of the earth at some distance from the spot. We found when we ceased blowing in gas that after a time the chokedamp receded in the upcast, and that whenever we blew it into the downcast it poured out of the upcast in volumes, being thus a perfect measure of the quantity of chokedamp in the mine, and giving us a proof that it had passed completely through it.

After keeping the mine full for upwards of three weeks, it was thought advisable to blow in chokedamp at a lower temperature than we had been

previously doing, which we believed to have been about the temperature of 250, though we did not test it very accurately. In order to effect this Mr. Gurney used a very beautiful contrivance, by which, by the power of the steam-jet, water was driven into the shaft along with the chokedamp in the form of the finest spray. Indeed, the best idea that is to be given of it is that it resembled Scotch mist, a medium universally admitted to have very rapid and powerful cooling properties. This process Mr. Gurney thought very important, as he considered the difficulty of cooling the immense magazine of heat after the fire was extinguished, to prevent reignition on the admission of fresh air, to be the most uncertain part of the whole experiment. That he could extinguish the fire he had no doubt whatever, but to cool down the waste against the existing conditions of non-conduction and non-radiation, he considered far more difficult.

The water being so minutely divided by the immense force of the jet, was held in suspension in the air, and floated on with it through the water. A large portion was in actual solution, but far the greater part was simply mechanically suspended like fine mist, and did not precipitate or condense.

When the temperature was sufficiently reduced, as indicated by the thermometer, so as to leave no fear of reignition, fresh air was blown in by the spray-jet, so as to pass through the mine charged with water, in order to cool it enough to allow of its being entered. After a time the action of the jet was reversed, and the air drawn through the mine in a contrary direction, so drawing out the air we had blown in charged with mist, and we continued drawing out mist or vapor for several days, which showed that it had filled every part of the waste, and had remained suspended. The temperature of the air that was drawn out gradually decreased at the rate of about six degrees a day. After about one month's operations the down-cast shaft was uncovered and descended, and found to be of a temperature of about 98. The waste was examined by Mr. Ma'her, who had reported that falls had taken place so as to leave no passage to enable us to go any distance into it. A shaft was then sunk into the middle of the burning waste at the point where the fire was supposed to have been most fierce at the commencement of our operations. The roof was here found to have fallen, so that it was impossible to enter. The fire, however, was extinct. Several bore-holes have been driven into the waste at different points, and no fire can be discovered; and this mighty volcano is extinct.

The vast amount of property endangered, (in this case of the value of near £200,000,) and the frequency of the occurrence of these kinds of accidents, give a great public interest to this operation. It is but two years ago that the proprietor of the Dalquarren coal-mine in Ayrshire, lost in half an hour £1,200 a year by a fire breaking out in one of his pits, which led to the total abandonment of the seam in which it occurred. It has burnt and destroyed the wood on the surface, and extended over fourteen acres, but is now, I may add, undergoing extinction by the same process, with every prospect of success. The great importance of the subject, in connection with the commercial and mining wealth of the country, must be my excuse for trespassing thus much on your columns and on the public patience.

I remain, sir, your obedient servant,

EDWARD CAYLEY.

9, Manchester Buildings, Westminster, May 1.

From the Morning Chronicle, 17th May.

THE UNITED STATES IN THE EXHIBITION.

THE number of articles sent from the United States to the Exhibition is neither what was expected of them, nor, we believe, does it adequately represent their capabilities. There are, nevertheless, many things in their collection which may be examined with interest and profit, and which do credit to their industry, ingenuity, and skill.

Foremost among the articles displayed in this division of the Exhibition are a coach, three or four wagons, a "buggy," technically so called, and a trotting "sulky." We call these "foremost," because, both by the prominent place they occupy, and on account of the real merit of the vehicles themselves, they are really so. The coach—styled by the exhibitor a "carriola"—is a very creditable piece of workmanship. It is of good design, apparently most thoroughly well built, and finished with great regard to good taste. There is nothing of the gewgaw style about it. The color, decorations, mountings, finish, and ornaments are all rich and neat. It sweeps gracefully over its curve, as a coach ought to sweep. The carvings upon it are admirably well executed, and, for symmetry and good keeping in every part, from the step of the footman to the board of the driver, it deserves high commendation. The wheels are much lighter than in carriages of a similar kind in England. This is claimed as a decided improvement. Certainly the appearance of the vehicle is improved by the absence of that bulkiness which gives a lumbering aspect to many an English carriage; and, if the roads of our transatlantic brethren are not too rough to deal fairly with such wheels, we know not why they should be considered unsafe upon English turpikes.

The other vehicles exhibited are respectively entitled a York wagon, a Prince Albert wagon, a slide-top buggy, and a trotting sulky. The chief characteristic of all of these is their extreme lightness of weight, when compared with their size. They are richly finished within and without, and beautifully carved; they are upholstered with exceeding taste, made with constant regard to the comfort of the rider, and exhibit very considerable artistic merit in their design. The wheels are made from carefully chosen material, the joints exactly fitted, the felloes (two in number, instead of the usual five or six, for greater strength) are confined by a steel insertion and bolts, and the axletrees are exceedingly neat and strong. It is claimed for these axletrees (an American invention) that, in loss of friction, strength, freedom from all noise in motion, and cleanliness, they are superior to any in England. Several of these lighter carriages are now in use in this country, and give great satisfaction; and several more of a similar manufacture have been recently ordered from New York. Indeed, it is not difficult to understand why they should become favorites out of London; nor how reluctantly a lover of quick driving would return to the heavier vehicles of city manufacture.

There are several sets of harness, both single and double, among the articles exhibited, which deserve notice. That exhibited by Messrs. Lacey and Phillips is a rich and elegant specimen of manufacture. It is made from leather of the first quality, and with perfect thoroughness of work. The mountings are of solid silver, with appropriate and graceful designs. In this, as in all the other harness shown, there is remarkable lightness and airiness, and an obvious endeavor to do away with all superabundance of weight.

On a bay in the main aisle, upon the south side of the building, are two chandeliers and several lamps, from the manufactory of Messrs. Cornelius and Co., in Philadelphia. The great use of oil in the United States has led to many improvements in lamps—especially in those upon the solar principle, as it is called (where increased draught is made to bear upon the combustion) which are unknown among us. Unpretending as these lamps appear, it is stated that they will give an amount of light greater by one half than any others in use. The chandeliers hanging above them are graceful specimens of workmanship, designed in good taste, and showing a crystal purity of glass. The casting is remarkable for its fineness, sharpness, and uniformity. The branches, formed by arabesque scrolls, profusely ornamented with birds and flowers, delicately sculptured or in bold relief, with centres of richly cut glass, claim particular approval for their elegance and lightness of design. This is among the youngest branches of manufacture in the United States, it being scarcely fifteen years since every chandelier, girandole, mantel lamp, and candelabra used in that country was imported from Europe; and it argues considerable enterprise and perseverance, on the part of the manufacturers, that they have attained so much excellence as to be willing to vie in the Exhibition with the oldest and most celebrated houses of the world.

On the south side of their portion of the building, the contributors from the States exhibit, under the general classification of raw material, many very excellent specimens. There are among these a large variety of articles, such as Indian corn, ground, hulled, and in the ear; rye, oats, barley, wheat, rice, cotton, tobacco, minerals, chemicals, woods, brooms, beef, pork, lard, hams, and almost everything else identified with the productions of that country. Next in order are to be seen daguerreotypes, paintings, herbaria, and prints, with some samples of stained glass suspended from the galleries, and cottons, carpets, wrought quilts, calicoes, and needlework, tastefully displayed around. Considering the distance from which these had to be conveyed, not only across 3000 miles of ocean, but often from little short of that distance inland—and considering, too, that it is not in her manufactures that America makes her chief impression upon the world—we regard this portion of her exhibition with great interest. In pianofortes there is a show highly creditable to the manufacture of musical instruments in the United States. Pierson exhibits a seven-octave grand pianoforte; Chickering a semi-grand, and other instruments of less pretension but of much merit. There are two from the manufactory of Conrad Meyer, of Philadelphia, in neat and very unpretending cases, which combine all the best qualities of the highest rank of pianos. In breadth, freedom, and evenness of tone, in promptness and elasticity of action, and in a combination of everything that is rich and sweet in this description of instrument, he claims to be unsurpassed.

Among cordage, boats, oars, and models of favorite ships, are exhibited two ship-ventilators, by Frederick Emerson, of Boston. These are intended to supersede the ordinary wind-sail now in use for sending pure air into the recesses of ships. The inventor has given much attention to the subject of ventilation, and his success has been honored by several gold medals in the United States. How far this application of his invention may be superior to the methods now in use for the

same purpose is uncertain. In the minds of sailors there is always an objection to fixtures above deck, which would be likely to impede their general introduction.

Together with daguerreotypes, before alluded to, there are exhibited camera obscuras by C. C. Harrison, of New-York, the results of which, in the pictures that hang above them, are exceedingly favorable. There are shawls from the Bay State mills, of beautiful color and a high perfection of manufacture; white cotton goods, which, in bleaching, finishing, and putting up, appear equal to Manchester products; some very beautiful flannels, single-milled doeskins and wool-back cassimeres of thorough fabric; tweeds, well mixed and of good colors; a salamander safe, well made; an improved bank lock, ingenious and well executed; a patent paying machine for pitching the seams of vessels, the box being provided with a ventricle wheel, which receives the hot melted material, and applies it neatly, economically, and directly to the seam to be covered; an air-exhausted coffin, car-wheels for rail-roads, wood and cork legs, clocks, watches, dentists' tools and works, India-rubber goods of various forms, mathematical and solar instruments, a self-determining variation compass, trunks, boots and shoes, hats, specimens of printing and binding, together with pistols, rifles, and other weapons of offence and defence. Of these rifles, manufactured by Robbins and Lawrence, it is but just to say that they are among the best, if not the best, of any rifles manufactured in the world, the Americans claiming to excel in this species of manufacture. They are made from the best selected Copake cold-blast forge iron, and are of an unpretending style, but remarkable for a plain, substantial and perfect finish; they are strong, simple, and thorough in their workmanship, and eminently adapted for real service.

Two bell telegraphs, exhibited in the central avenue, very deservedly attract much attention. The bell telegraph, otherwise called an "annunciator," is an invention made to supersede the awkward array of bells, in houses and hotels. It is an extremely neat and beautiful article, and indicates whence the bell was rung, by uncovering a number corresponding to the number of the room—and this, too, for any length of time afterwards, until, by the touch of a spring, the number is recovered. In the large hotels in the United States, and in many private residences, it is much used.

In the moving machinery department, among other objects of interest from the United States, is a machine exhibited by Mr. Charles Morey, called a stone-dressing machine. A machine for dressing stone by power has long been regarded as a great desideratum, and has been the object of many expensive though unsuccessful experiments. One great difficulty has been found in making the cutting tools of a quality to stand the action of stone, unless at such cost as to render their use unprofitable. This difficulty is overcome by the invention before us, which consists in the employment of chilled cast-iron burrs, or rolling cutters. Iron, as is now known, may, by a peculiar process of chilling in casting, be converted to a diamond hardness, that perfectly fits it for reducing, with great facility and economy, the surface of stone. The burrs made in this way retain a sufficient degree of sharpness for a long time, and can be maintained at a small cost, being wholly formed and finished in casting. In dressing circular forms, the stones are made to revolve, when the burrs, which are mounted in

sliding rests, are brought into action. For straight surfaces, however, the stones are laid on a transverse bed, and the cutters, mounted upon a revolving cylinder, are placed above them. The burrs or cutters are so arranged as to turn freely on their axis when brought in contact with the stone, and as they roll over it they crush it away in the form of scales and dust. By varying the shape and arrangements of the burrs, ornamental surfaces may be produced.

Among the agricultural implements exhibited which claim the attention of agriculturists particularly, are reaping machines, ploughs, cultivators, fan mills, and smut machines. The American reapers are worked by a single span of horses abreast, with a driver and a man to rake off the grain as it is cut down by movable knives. On land free from obstructions, these reapers will cut from twelve to twenty acres of wheat in a day, depending somewhat upon the speed of the horses and the state of the grain. The grain is left in a proper condition for the binders, who follow after the machine, and the grain is cut quite as clean as by any other method, either by the sickle or the cradle. M'Cormick's Virginia reaper (No. 73) is in very general use, 1,800 machines having, we believe, been sold in the United States in 1850. Hussey's reaper (No. 65) is also in general use, and operates remarkably well. These implements will enable the farmer to gather his crop in a very short time, securing the wheat and other grain at the very time it is in proper condition for harvesting, thus avoiding the alternative to which he now is obliged to resort, of harvesting a portion of his field before fully ripe, and a portion after it is too ripe to make the best flour. In point of economy they are very important, reducing the expense very much from that of the ordinary methods. In a climate as variable as that of Great Britain, the importance of these reaping machines must be apparent—enabling the farmer often in a single day to secure a crop which otherwise might be materially injured by the unfavorable state of the weather.

The ploughs exhibited are of various sizes, and adapted to various purposes, from a small one-horse plough for ploughing out Indian corn, sugar-cane, potatoes, turnips, &c., to the large plough for breaking up the stiffest soils. They are made of the best materials, are strong and durable, and are warranted to do their work in the very best manner. They are said to be of lighter draught than most ploughs in use, being worked in ordinary soils with entire ease by a single span of medium-sized horses. Among the ploughs exhibited is one upon a new principle, which has not heretofore been in use. It is a plough with two shares—one in front of the other on the same beam—the first being a small share, which takes off some three or four inches, and the other following, and being wider, takes a furrow of eight or ten inches deep, bringing up the soil so as to cover the first furrow entirely, leaving the land in a friable state, and ready for the seed after a slight harrowing. This is designed particularly for stiff soils, and for ploughing in green manure—such as clover, green crop, or other; and it completely covers the herbage, leaving the land in a fine condition for the seed. The cultivators exhibited are convenient and useful implements, at very moderate prices, and work well. The fan mills for cleaning grain are believed to possess some properties which are not found in those generally used—cleaning grain which is damp most perfectly. The smut machines exhibited are made

of iron, are very compact, very durable, easily repaired, and are warranted to clean from 15 bushels to 150 bushels per hour, according to the size of the machine. These implements are in very general use in the United States and in Canada, and are worthy the attention of all who are engaged in milling grain.

There are several smaller implements in the Exhibition which will commend themselves to every observer.

From the Times.

FOREIGN COPYRIGHT IN GREAT BRITAIN.

Exchequer Chamber, May 17.

(*Sittings in Error.*—Present, Lord CAMPBELL, and Justices PATTERSON, MAULE, WIGHTMAN, CRESSWELL, ERLE, and WILLIAMS.)

BOOSEY v. JEFFREYS.

MR. BOVILL said this case came before the court by way of a bill of exceptions to the ruling of Baron Rolfe. The object was to bring under review the decision of the Court of Exchequer in the case of "*Boosey v. Purday*," to raise the question whether there could be any copyright for a foreigner in this country, or whether such a right could be vested in any person who purchased of that foreigner. There was another question, whether there could be any assignment by a foreigner of a portion of the copyright to be confined to Great Britain, and whether an assignment made in Milan ought to have been attested by two witnesses. The facts were these:—Boosey was an English subject; he had purchased the copyright in *La Sonnambula* of a foreigner, and having purchased that right was the first person to publish it in this country. He had thus a *prima facie* title against the world; that title was sought to be impeached by the defendant, and his ground for doing so was that the work which he had purchased, and was the first to publish here, was originally composed by Bellini, a foreigner out of the British dominions. Bellini had transferred his interest in the work to Ricordi, at Milan. Ricordi came to England and transferred the right which he had so acquired to Boosey, so far as regarded the copyright in the British dominions. The main question was, whether an English subject could acquire from a foreigner the copyright of a work which was first published in this country. If a foreigner could acquire a copyright, he could transfer such right, and if he had no right, could he not give such permission to an English subject as to enable the Englishman to acquire the right to protection? On the other side it was said there was no property in the foreigner or in the English subject; but it was now submitted that such a work was property before the statute of Anne, and by the common law. The 8th Anne was the first statute passed for the protection of property of this description—of literary property.

Mr. Justice Maule.—Suppose Homer had a copyright, he could go about and recite his works.

Lord Campbell.—And might have had an injunction.

Mr. Bovill.—If there was the copy of one effusion of a man's brain he might withhold it or lend it or dispose of it. The statute of Anne was declared to be for the encouragement of learning by vesting the copyright in the author of literary works, and it enacted that after 1710, the author of any book, who had not transferred it to any other, or the book-

seller who had purchased it, should have the right. If the right existed in the author, an alien was entitled equally with a natural-born subject. If it was property, it was self-evident an alien was entitled.

Lord Campbell.—In personal property the law made no distinction.

Mr. Bovill.—By 7th and 8th Victoria, chap. 66, aliens might hold any description of personal property. If foreigners had a right by common law, how were they affected by the statute of Anne?

Lord Campbell.—Suppose a foreigner came over to see the Great Exhibition; he wrote a poem, would he not have a right to that poem?

Mr. Justice Maule.—Or suppose he wrote a very amusing article about it in a French paper?

Mr. Peacock said, the difference was as to the place in which he wrote it.

Mr. Bovill.—If the foreigner had the right, what difference did it make whether he wrote it here or elsewhere?

Lord Campbell.—He was encouraging our agriculture and manufactures by consuming our produce while he was writing the poem.

Mr. Bovill.—If the test were property or no property, it could make no difference, and it could not alter his right, whether he brought it here himself or gave it to a deputy; and if he could do that, he might transfer it to another, and give him the same right which he himself possessed. But it was said that the statute of Anne had been passed for the encouragement of native talent; but it was of equal advantage to this country that we should have the benefit, not only of the first publication of works of British subjects, but of the literature of the world.

Lord Campbell.—That argument extends to free trade.

Mr. Justice Maule.—A book written by a foreigner may be published with as much benefit as if written by an Englishman.

Mr. Bovill said, the enactments were for the encouragement of learning, to be applied to the public. He could find no reason why the right should be confined to British subjects. The learned counsel then adverted to the 1st Richard, and to the art of printing.

Lord Campbell.—If you go to the exhibition of painting, you will see a very excellent painting of Edward IV. and his queen visiting Caxton's printing establishment at Westminster, where Richard III. appears as Duke of Gloucester.

Mr. Bovill said, the result of the authorities was that foreign authors might have the benefit. If it was admitted that these works were property, then there was no difference between a foreigner and an Englishman. In the case of wild animals—

Lord Campbell said, stealing a lion, I suppose, would not be larceny, but there might be an action of trover.

Mr. Justice Maule.—It might be a tamed lion—not that I should be inclined to commit the larceny; but this is wandering from the point, and is something like a wild goose chase.

Mr. Bovill was about to proceed, when

Lord Campbell said—I made my bow of gratitude to you, Mr. Boville, for your very excellent argument, but I thought you had sat down.

Mr. Bovill, amid great laughter, said he had but a few words to add. He submitted that he had made out the proposition that this work was property at common law, that a foreigner had a

right to the copyright, and that the plaintiff in error was entitled to judgment.

Mr. Peacock, on the other side, would not dispute that a portion of a copyright might be sold, or that a foreigner might be entitled to copyright in this kingdom, or that a foreigner, if he had a copyright, might recover damages for its infringement, but he should contend that under the particular circumstances of this case the plaintiff had not a copyright. His proposition was, that a foreign author residing abroad, and not coming to this country, had no right, so long as he resided abroad at the time of the first publication, to claim protection. Where was the first publication? and where was the author at that time?

Mr. Justice Maule.—A foreign author, not having published it, assigns it to an Englishman, and the Englishman publishes in England after the assignment, the foreigner still living abroad. You say that the Englishman has no remedy for the infringement.

Mr. Peacock.—That the foreign author could not assign a right which he did not possess. A foreign author, who was residing abroad at the time when the first publication of his work took place in this country by his consent, had no copyright, and that an author in that situation could not transfer to an assignee any greater title than he had himself.

Mr. Justice Maule.—Suppose an actual inventor abroad sent over and obtained a patent in this country, would not that be a good patent?

Lord Campbell.—When I had the honor of being attorney-general I believe I granted many patents to persons abroad.

Mr. Peacock.—If a person introduced his invention abroad, he could not afterwards come here and obtain a patent.

Mr. Justice Maule.—So that persons might get their bread in the world, and support their wives and families, which was said to be laudable, by merely printing books published abroad by other person?

Mr. Peacock admitted that there were no words expressly limiting the right to native-born subjects. A man was not the author of a work until it was published. He would then urge that to make the assignment to Ricordi valid it should have been attested by two witnesses.

Lord Campbell said, he confessed he had little or no doubt upon the point, but from the high respect he had for the Court of Exchequer, he should like to take further time, and the court would probably give its opinion on Tuesday.*

19 May.

BOOSEY v. JEFFREYS.

THE court was crowded to hear the judgment in this case.

Lord Campbell said—This was an action for pirating a musical composition, entitled “A Cavatina from the Opera of *La Sonnambula*,” by Bellina. The declaration, which is in the common form, alleges that this musical composition had first been published in England within 28 years; that the plaintiff was the proprietor of the copyright therein; and that the copyright was subsisting at the time when the grievances complained of were committed. The defendant pleads—first, that the plaintiff was not the proprietor of the copyright in the declaration mentioned; secondly, that there was not at the time of the committing of the said supposed grievances a subsisting copyright in the

composition. The trial coming on before Baron Rolfe, now Lord Cranworth, evidence was given on behalf of the plaintiff, that the opera of *La Sonnambula*, from which the composition in question was taken, was composed by Bellini, an alien at Milan, in February, 1831; that Bellini then resided and had ever since resided at Milan; that by the law of Milan he was entitled to the copyright in this work, and to assign it to any one he pleased; that on the 19th of February, 1831, by an instrument in writing, signed by him at Milan, he did, according to the law of Milan, assign the copyright to Ricordi, also an alien; that such copyright and the right to assign the same became vested in Ricordi; that on the 9th of June, 1831, Ricordi, in England, made, signed, and sealed, attested by two witnesses, an indenture, whereby, for a valuable consideration, he assigned the copyright of the opera of *La Sonnambula*, for and in Great Britain, to the plaintiff, who was a native-born British subject; that the plaintiff published the opera of *La Sonnambula* in London on the 10th of June, 1831; that there had been no prior publication of it in Great Britain or any other country; that on the 10th of June, 1831, the plaintiff made the usual entry at Stationers'-hall in respect of the publication, and deposited copies at the British Museum and other places, and on the 13th of May, 1844, he caused further entries to be made at Stationers'-hall, according to the 5th and 6th Victoria, c. 45. The learned judge, in conformity with the decision of the Court of Exchequer in "*Boosey and Purday*," directed the jury that that evidence was not sufficient, and directed them to find a verdict for the defendant. To this ruling a bill of exceptions was tendered, upon which the present writ of error was brought. After listening to a very learned argument, we are all of opinion that the evidence was sufficient to entitle the plaintiff to a verdict on both the issues, and therefore there must be a *venire de novo*. The first question discussed was whether authors had a copyright in their works at common law. That is not essential to our determination of the present case; if it were, we are strongly inclined to agree with Lord Mansfield and other judges, who in several cases declared themselves to be in favor of the common law right of authors, but we rest our judgment on the statutes respecting literary property, which we think entitled the plaintiff to maintain this action upon the evidence adduced on the trial:—the Court of Exchequer in "*Boosey and Purday*," 4 Exchequer Reports, 145, overruling the prior decision of that court on the equity side, the decision of the Common Pleas and the decisions of the Queen's Bench, authorities all directly in point, expressing an opinion that in such an action the right of the plaintiff must depend on the statute law of this country; that the laws of foreign nations have no extra-territorial power, and the proper construction of the statutes of Anne and of George III., that a foreign author residing abroad was not an author within their meaning, and could not have a copyright in his works, which acts were intended for the encouragement of British talent, by giving to British authors a monopoly in their literary works, dating from the period of their first publication here. The learned judge therefore held that a foreigner by publishing his work in Great Britain acquired no copyright. If these premises are sound, the inference drawn from them is incontrovertible, that a British subject who purchases from a foreigner such a right as he had in his own country cannot be in a better condition

here than the foreigner would have been himself. But, with great deference to an opinion so expressed, we see no sufficient reason for thinking that it was the intention of the legislature to exclude foreigners from the benefit of the statutes. The British Parliament has no power, and cannot be supposed to intend to legislate for aliens beyond the British territory; but within that territory it has the power, and, as we conceive, the general words must be presumed to do so. The monopoly which the statutes conferred is to be enjoyed here, and the conditions which they require for enjoyment are to be presumed here. What is there to rebut the presumption that aliens are entitled? The 8th Anne, c. 19, is entitled "An Act for the Encouragement of Learning," by vesting the right in printed books in authors. Assuming the legislature intended this necessarily for the encouragement of learning in Great Britain, may it not be highly for the encouragement of learning in this country that foreigners should be induced to send their works here to be first published in London? If Rapin and De Lolme had written their valuable works without ever visiting this country, could it be contended that they should be debarred from assigning their property to the publisher? It would ill become us to offer opinions upon the policy of introducing agricultural produce or manufactures, but, looking at the statutes, we may without impropriety observe that it has been the uniform policy of Parliament to facilitate the importation of foreign literature. Although printing had been introduced and carried on by Caxton in the time of Edward IV., when an act passed to restrain foreigners from carrying on trade here, a provision was added by section 12, that that act should not extend to prevent any trader, of whatever nation he might be, from bringing into this country any books written or printed. The question really is, whether a foreigner by sending to a publisher his work here acquires a copyright. Upon this depends his right to transfer his right to another. It is admitted that a foreigner, if he composes a literary work here, may acquire a copyright, and Mr. Peacock would not deny that if a foreigner, being here for a temporary purpose, while here wrote a poem, he might publish it and acquire a copyright in it here. If he had composed it in his own country and brought it over in his memory and produced it here for the first time, or if he had written out a book in manuscript, would it have made any difference as to his rights? Can his personal appearance within our realm be essential to his right as an author, if he does that by an agent which it is not disputed he might do in his own proper person? The right is to acquire a monopoly in England for the sale of his work; the right is personal property, which he carries with him wherever he is, and all that is to be done to negotiate it he may do by another. Where, then, can be the necessity of crossing from Calais to Dover before giving instructions for the publication of his work and entering it at Stationers'-hall? The law of England will protect his property, and recognize his rights, and give him redress for wrongs inflicted upon him here. In the 6th of Henry VIII. the Common Pleas held that aliens residing in France might maintain an action of debt here, although aliens can have no land. It has been held that an alien, although he had never been in this country, might maintain an action for an injury to his reputation contained in a libel—and that great judge, Chief Justice Tindal, had observed that it would create in foreigners an un-

favorable opinion of our laws if we held that aliens could not maintain an action of this description; and my brother Maule likewise points to the fact of our courts going further in allowing actions to be brought by foreigners for running down ships upon the high seas. If Gibbon, after writing the *Decline and Fall* at Lausanne, had published it there, could it be doubted that, while domiciled there, he could, having caused his work to be published in London, acquire the same right as an English author? For such a purpose, what difference can it make whether the author be an alien or a natural-born subject? In the present case I suppose it would be admitted that the defence would have been done away with if Bellini had been naturalized by act of Parliament. For these reasons we think that if an alien, residing in his own country, were to compose a literary work there, and should continue to reside there without publishing his work, but should cause it to be published in this country, he would be an author for the encouragement of learning, and might maintain an action against any one who should pirate his work. We wish to be understood as speaking of the rights of a foreigner first publishing his work in England; but, if a literary work is once published, an author can only claim a copyright by the law of the country in which it is first published. This is the doctrine of our courts, and the legislature must be considered as having adopted and sanctioned it by the enactments of international statutes. Mr. Peacock contended that though an alien residing abroad might publish here, he could not transfer the right to another; but if by the law of a foreign country in which he resides the right may be assigned to a publisher, with a right of again assigning, the assignee of the author, or his assignee, becomes the owner of the property. It consists in the right of retaining a monopoly for the sale of a work in the country in which it is first published. Whatever right the author of this work had of publishing in England was transferred by him to Ricordi, and by Ricordi to the plaintiff. With regard to the authorities which have been cited, we may perhaps be justified in saying that they are rather in favor of the doctrine we adopt. One point still remains. Mr. Peacock argued that there is upon the evidence no valid assignment to Ricordi, there being no allegation that it was attested by two witnesses. Now, looking at the assignment in the bill of exceptions, it might be presumed that there was such an assignment executed as was sufficient, but, at all events, we think the title sufficient upon the statement that Bellini assigned to Ricordi, according to the law of Milan. This is not like a conveyance of real property in England, or an assignment of personalty in England, which must be attested in a particular form. When this assignment was made it had no reference to England, and it was merely sufficient to clothe Ricordi with all the rights of property in the opera of *La Sonnambula*. The assignment by Ricordi to the plaintiff was made according to all the forms of English law. Upon the whole, we think the learned judge ought to have directed the jury that, if they believed the evidence, they should find a verdict on both issues for the plaintiff, and therefore we direct a *venire de novo*.

From the Gentleman's Magazine.

THE SAYINGS OF KING CHARLES II.

"I HAVE made a collection," said Walpole, "of the witty sayings of Charles II., and a collection of

bon-mots by people who only said one witty thing in the whole course of their lives." Both these collections are, it is believed, unfortunately lost. The former deficiency I have, however, attempted to supply (I fear imperfectly) in the following chapter; regarding remarkable sayings as among the very best illustrations of individual character and manners.

The satirical epitaph written upon King Charles II., at his own request, by his witty favorite, the Earl of Rochester, is said to be not more severe than it is just:

Here lies our sovereign lord the king,
Whose word no man relies on;
Who never said a foolish thing,
And never did a wise one.

How witty was the reply: "The matter, he observed, was easily accounted for—his discourse was his own, his actions were his ministry's."

A good story of the king and the loyal lord mayor of London, at a Guildhall dinner, has been preserved to us in the Spectator. The king's easy manner, and Sir Robert Viner's loyalty and due sense of city hospitality, carried the great dignitary of Guildhall into certain familiarities not altogether graceful at any time, and quite out of character at a public table. The king, who understood very well how to extricate himself from difficulties of this description, gave a hint to the company to avoid ceremony, and stole off to his coach, which stood ready for him in Guildhall Yard. But the mayor liked his majesty's company too well, and was grown so intimate that he pursued the merry sovereign, and, catching him fast by the hand, cried out, with a vehement oath and accent, "Sir, you shall stay and take t'other bottle." "The airy monarch," continues the narrator of the anecdote, "looked kindly at him over his shoulder, and with a smile and graceful air, (for I saw him at the time and do now,) repeated this line of the old song:

He that's drunk is as great as a king,

and immediately turned back and complied with his landlord." This famous anecdote is importantly illustrated by a letter from the Countess Dowager of Sunderland to her brother, Henry Sidney, written five years after the mayoralty of Sir Robert Viner. The king had supped with the lord mayor; and the aldermen on the occasion drank the king's health over and over upon their knees, wishing every one hanged and damned that would not serve him with their lives and fortunes. But this was not all. As his guards were drunk, or said to be so, they would not trust his majesty with so insecure an escort, but attended him themselves to Whitehall, and, as the lady-writer observes, "all went merry out of the king's cellar." So much was this accessibility of manner in the king acceptable to his people, that the mayor and his brethren waited next day at Whitehall to return thanks to the king and duke for the honor they had done them, and the mayor confirmed by this reception was changed from an ill to a well affected subject.

It was an age of nicknames—the king himself was known as "Old Rowley," in allusion to an ill-favored but famous horse in the Royal Mews. Nor was the cognomen at all disagreeable to him. Mrs. Holford, a young lady much admired by the king, was in her apartments singing a satirical ballad upon "Old Rowley the King," when he

knocked at her door. Upon her asking who was there, he, with his usual good-humor, replied "Old Rowley himself, madam." Hobbes he called "the Bear." "Here comes the Bear to be baited," was his remark, as soon as he saw the great philosopher surrounded by the wits who rejoiced in his conversation. A favorite yacht received from him the name of "Fubbs," in honor of the Duchess of Portsmouth, who was plump and full in her person. The queen he called "a bat," in allusion to her short, broad figure, her swarthy complexion, and the projection of her upper lip from a protuberant forehead.

His politeness was remarkable, and he could convey a rebuke in the style of a wit and a gentleman. When Penn stood before him with his hat on—the king put off his. "Friend Charles," said Penn, "why dost thou not keep on thy hat?" "Tis the custom of this place," replied the monarch, in his usual strain of pleasantry, "that never above one person should be covered at a time."

When reprimanded by one of his courtiers for loading or interlarding his discourse with unnecessary oaths, he defended himself by saying, "Your martyr swore twice more than ever I did." And, in allusion again to his father's character, he observed to Lord Keeper Guildford, who was musing somewhat pensively on the woollen sack, "My Lord, be of good comfort, I will not forsake my friends as my father did." To Reresby he remarked, "Do not trouble yourself; I will stick by you and my old friends, for if I do not I shall have nobody stick to me;" and on another occasion he said to the same memorialist, "Let them do what they will, I will never part with any officer at the request of either house; my father lost his head by such compliances, but, as for me, I intend to die another way."

Seeing a soldier of the Parliament—one of Cromwell's officers, and one active against the king—led through the streets of Oxford as a prisoner, he asked what they designed to do with him. They said they were carrying him to the king, his father. "Carry him rather to the gallows and hang him up," was the reply; "for if you carry him to my father he'll surely pardon him." This was not cruelty in Charles—but rather a brief illustration of his father's character.

He was altogether in favor of extempore preaching, and was unwilling to listen to the delivery of a written sermon. Patrick excused himself from a chaplaincy, "finding it very difficult to get a sermon without a book." On one occasion the king asked the famous Stillingfleet, "How it was that he always read his sermons before him when he was informed that he always preached without book elsewhere?" Stillingfleet answered something about the awe of so noble a congregation, the presence of so great and wise a prince, with which the king himself was very well contented. "But pray," continued Stillingfleet, "will your majesty give me leave to ask you a question? Why do you read your speeches when you can have none of the same reasons?" "Why, truly, doctor," replied the king, "your question is a very pertinent one, and so will be my answer. I have asked the two houses so often and for so much money, that I am ashamed to look them in the face." This "slothful way of preaching," for so the king called it, had arisen during the civil wars; and Monmouth, when Chancellor of the University of Cambridge, in compliance with the order of the king,

directed a letter to the university that the practice of reading sermons should be wholly laid aside.

When Cosins, Bishop of Durham, reminded the king that he had presumed to recommend Sancroft and Sudbury as chaplains to his majesty, the king replied, "My lord, recommend two more such to me, and I will return you any four I have for them."

One of his replies to Sir Christopher Wren is characteristic both of the merry monarch and of the great architect. The king was inspecting the new rooms which Wren had built for him in his hunting-palace at Newmarket, and observed that "he thought the rooms too low." Sir Christopher, who was a little man, walked round them, and looking up and about him said, "I think, and it please your majesty, they are high enough." Charles, squatting down to his architect's height, and creeping about in this whimsical posture cried, "Aye, Sir Christopher, I think they are high enough."

The elder Richardson was fond of telling a characteristic story of the king and kingly honor. A cut-purse, or pickpocket, with as much effrontery of face as dexterity of finger, had got into the drawing-room on the king's birthday, dressed like a gentleman, and was detected by the king taking a gold snuff-box out of a man of quality's pocket. The rogue, who saw his sovereign's eye upon him, put his finger to his nose, and made a sign to the king with a wink to say nothing. With a like presence of mind the king took the hint, and, watching the earl, enjoyed his feeling first in one pocket and then in another for his missing box. The king now called the nobleman to him. "You need not give yourself," he said, "any more trouble about it, my lord, your box is gone; I am myself an accomplice—I could not help it, I was made a confidant."

Of his graver and deeper remarks Dryden has preserved a specimen. "I remember a saying," writes the poet, "of King Charles II. on Sir Matthew Hale, (who was, doubtless, an uncorrupted and upright man,) that his servants were sure to be cast on any trial which was heard before him; not that he thought the judge was possibly to be bribed, but that his integrity might be too scrupulous; and that the causes of the crown were always suspicious when the privileges of subjects were concerned." The wisdom of the remark, as respects Sir Matthew Hale, is confirmed by Roger North. "If one party was a courtier," says North, "and well dressed, and the other a sort of puritan, with a black cap and plain clothes, Hale insensibly thought the justice of the cause with the latter." Nor has it passed without the censure of Johnson: "A judge," said Johnson, "may be partial otherwise than to the crown; we have seen judges partial to the populace."

His easy, gentlemanlike way of expressing disapprobation is exemplified in a saying to which I have already had occasion to refer. "Is that like me?" he said to Riley the painter, to whom he had sat for his portrait, "then, odd's fish, I am an ugly fellow."

When told that the Emperor of Morocco had made him a present of two lions and thirty ostriches, he laughed and said, "He knew nothing more proper to send by way of return, than a flock of geese."

Of Harrow Church, standing on a hill and visible for many miles round, he is said to have remarked "that it was the only visible church he knew."

"Pray," he said at the theatre, while observing the grim looks of the murderers in *Macbeth*, "pray what is the reason that we never see a rogue in a play, but, odd's fish! they always clap him on a black periwig, when it is well known one of the greatest rogues in England always wears a fair one!" The allusion was to Oates, or, as I suspect, to Shaftesbury, and the saying was told by Betterton to Cibber.

He was troubled with intercessions for people who were obnoxious to him, and once when Lord Keeper Guildford was soliciting the king's favor on behalf of one he did not like, he observed facetiously, "It is very strange that every one of my friends should keep a tame knave."

One day while the king was being shaved, his over-officious trifter of a barber observed to him that "he thought none of his majesty's officers had a greater trust than he." "Oy," said the king, "how so, friend?" "Why," said the royal shaver, "I could cut your majesty's throat when I would." The king started up and said, "Odds fish, that very thought is treason; thou shalt shave me no more." The barber of Dionysius, who had made the same remark, was crucified for his garrulity; but honest Rowley was not cruel. His loquacious barber was only dismissed. "Falsehood and cruelty," he said to Burnet, "he looked on as the greatest crimes in the sight of God."

Of Wooley, afterwards Bishop of Clonfert, he observed wittily and with great knowledge of character, that "He was a very honest man, but a very great blockhead—that he had given him a living in Suffolk swarming with Nonconformists—that he had gone from house to house and brought them all to church—that he had made him a bishop for his diligence; but what he could have said to the Nonconformists he could not imagine, except he believed that his nonsense suited their nonsense."

He was so pleased with a passage in a sermon by South that he laughed outright, and turning to Laurence Hyde, Lord Rochester, "Odds fish, Lory," said he, "your chaplain must be a bishop, therefore put me in mind of him next vacancy." Of Barrow, he said that "he was an unfair preacher," because, as it has been explained, he exhausted every subject and left no room for others to come after him;—but the king's allusion was made somewhat slyly to the extraordinary length as well as to the unusual excellence of Barrow's sermons.

He said often, "He was not priest-ridden; he would not venture a war nor travel again for any party." Such is Burnet's story, curiously confirmed as it is by Sir Richard Bulstrode's conversation with the king on his former exile and the then condition of the country. "But," said the king, most prophetically indeed, "I am weary of travelling, I am resolved to go abroad no more; but when I am dead and gone, I know not what my brother will do. I am much afraid that when he comes to the crown he will be obliged to travel again."

He observed, in allusion to the amours of the Duke of York and the plain looks of his mistresses, that, "he believed his brother had his mistresses given him by his priests for penance."

After taking two or three turns one morning in St. James' Park, the king, attended only by the Duke of Leeds and my Lord Cromarty, walked up Constitution-hill into Hyde Park. Just as he was

crossing the road, where Apsley House now is, the Duke of York, who had been hunting that morning, on Hounslow-heath, was seen returning in his coach, escorted by a party of the guards, who, as soon as they saw the king, suddenly halted, and stopped the coach. The duke, being acquainted with the occasion of the halt, immediately got out, and, after saluting the king, said he was greatly surprised to find his majesty in that place, with so small an attendance, and that he thought his majesty exposed himself to some danger. "No kind of danger, James," was the reply; "for I am sure no man in England will take away my life to make you king." The old Lord Cromarty often mentioned this anecdote to his friends.

"It is better to be envied than pitied," was his observation to Lord Chancellor Clarendon.

"He that takes one stone from the church takes two from the crown," was another of his sayings preserved by Pepys.

He said to Lauderdale, "To let presbytery go, for it was not a religion for gentlemen."

If his short characters of men were at all like the one that has been preserved to us of Godolphin, we have lost a good deal from their want of preservation. Of Godolphin he said, when only a page at court, "that he was never *in* the way, and never *out* of the way;" and this was a character, says Lord Dartmouth, which Godolphin maintained to his life's end.

When told by Will Legge that the pardoning of Lord Russell would, among other things, lay an eternal obligation upon a very great and numerous family, he replied, with reason on his side, "All that is true; but it is as true, that if I do not take his life he will soon have mine."

Eager for the marriage of the Princess Mary to the Prince of Orange, and when reminded of his promise to the Duke of York, (to whom the match was unwelcome,) that he would not dispose of the duke's daughter in marriage without the duke's consent, he replied it was true he had given his brother such a promise, "but, odd's fish, he *must* consent."

When Sancroft, then only dean of St. Paul's, was brought to the king by Will. Chiffinch, that Charles might tell him in person of his appointment to the archbishopric of Canterbury, the dean urged his unfitness for the office, and requested his majesty to bestow it on some more worthy person. The king replied, "that, whether he would accept it or not, he had already given away his deanery to Dr. Stillingfleet."

When Sir John Warner turned Papist, he retired to a convent, and his uncle, Dr. Warner, who was one of the king's physicians, upon apprehension that Sir John might convert his property to popish uses, pressed his majesty to order the attorney-general to proceed at law for securing his estate to him, as next male; "Sir John at present," said the king, "is one of God Almighty's fools, but it will not be long before he returns to his estate, and enjoys it himself."

During the debate on a bill for disabling all Papists from holding any court place or employment, the king was supposed to speak through the Earl of Shaftesbury, then lord chancellor, whilst his brother the Duke of York was represented by Sir Thomas Clifford, then lord treasurer. Clifford made a violent speech, and was smartly answered by Shaftesbury. "What a rogue you have of a lord chancellor!" was the remark of the duke

to the king, (for both were present;) to which Charles replied, "And what a fool you have of a lord treasurer."

One of his last sayings related to his new palace at Winchester. He was impatient to have the works finished, saying "a year was a great time in his life."

When he was dying the queen sent an excuse for her absence. She said that she was too unwell to resume her post by the couch, and implored pardon for any offence which she might unwillingly have given. "She ask my pardon, poor woman!" cried Charles. "I ask hers with all my heart."

His wit never forsook him. When near his last moments he apologized to those who stood round him all night for the trouble he had caused. "He had been, he said, a most unconscionable time dying; but he hoped that they would excuse it." A similar sense of etiquette ruffled the last moments of the polite Earl of Chesterfield, whose only expressed anxiety related to his friend Dayrolles being in the room without a chair to sit down upon.

If he was ready at a reply, there were others about him who were not less happy. When Charles called Lord Chancellor Shaftesbury, in his own hearing, "the greatest rogue in England," the reply made by Shaftesbury was full of point and spirit. "Of a subject, sir, perhaps I am." Not less witty was the sarcastic answer of the Earl of Dorset. The earl had come to court on Queen Elizabeth's birthday, long kept as a holiday in London and elsewhere, and still, I believe, observed by the benchers of Gray's Inn. The king, forgetting the day, asked "What the bells rung for?" The answer given, the king asked further, "How it came to pass that her birthday was still kept, whilst those of his father and grandfather were no more thought of than William the Conqueror's?" "Because," said the frank peer to the frank king, "she being a woman chose men for her counsellors, and men when they reign usually choose women." Of the same stamp was the more than half-heard *aside* of the Duke of Buckingham, to his appeal to the monarch "as the father of his people." "Of a good many of them," was the sarcastic comment of the author of the Rehearsal.

I have referred in a former chapter to the king's partiality for his dogs; one species of which is still celebrated among the fancy as King Charles' breed. On his entry into Salisbury, an honest cavalier pressed forward to see him, and came so near the coach that his majesty cautioned the poor man not to cling too close to the door lest one of the little black spaniels in the coach should chance to bite him. The loyalist still persisting in being near, one of the spaniels seized him by the finger, and the poor fellow, whilst he was in pain, cried out with a loud voice, "God bless your majesty, but d—n your dogs!" This story has been preserved to us by the mercurial Duke of Wharton as an illustration of the indulgence which the king accorded to his subjects on all occasions—as an instance of the popular, easy, and endearing arts, which ensure to a monarch the love and good will of his people.

But his best saying was his last—"Let not poor Nelly starve!" the last request of the merry monarch.

PASSPORTS.—From English travellers to their passports is a natural progression. I perceive from the repeated letters of delayed and perplexed voyagers that the new foreign-office reform does not work smoothly, and that the real value of an "official"

passport is beginning to be discovered by the contempt with which it is frequently treated. It may be as well to explain again what the Prussian government required, and how little Lord Palmerston's new regulation meets the demand. The Prussian police, in requiring that English subjects should travel with an "English" pass, meant that that document should be what it is in Prussia—a "legitimation," or official certificate of the identity of the individual. Such a document there is, as stated in a former letter, no official machinery in England for issuing. In Germany the district police keeps a register of every man, and he cannot move without his "papers," his "legitimation." Granting them is then no part of the duty of the foreign minister, unless the person may be on a government mission. It is necessary clearly to understand the great difference between the continental importance of a "pass," and the value we attach to it. With us it is but a larger kind of turnpike ticket, which proves nothing except that the holder has made his way so far on his journey, and is only thought useful inasmuch as it may clear him through the next gate. To a German the pass is the proof of his existence, and the only title he has to live and move unmolested by the police. Without it the law does not recognize him, he falls into the rubric of vagabonds, thieves, and fugitives from justice, of whom everything dangerous, from arson to regicide, may be expected. A German without his "legitimation" in his pocket, therefore, feels like an assassin, who at any moment may feel the gripe of the police on his collar. An Englishman believes (erroneously on the continent) that his presence in the shape of five feet nine of respectability on any spot of the earth's surface is proof enough at least that he must once have been born, and had a name; and that nobody has charged him with swindling or theft is equally a proof that the police have nothing to do with him. He therefore cares little for his passport, neglects the official forms, forgets to have it *viséd*, cannot imagine why such a fuss is made about nothing, and does not scruple even to abuse any functionary who may interfere with him—in innocent ignorance that even mere unpoliteness to any *employé* is punishable with fine or imprisonment, as "insulting a deputed officer of the crown in the discharge of his duties." A German cannot forget his "legitimation," and all belonging to it, while it is equally difficult to get an Englishman to remember it. More than half the embarrassments our countrymen get into are caused by their own neglect. Perhaps impressing on their minds the idea that without "papers" they are, in the "eye of the law," on the continent, vagabonds, thieves, and suspected persons, may induce them to pay more attention to those instruments. They too often only get a glimpse of the truth when they come into collision with the police.—*Times*, 19 May.

NEWSPAPERS IN GREAT BRITAIN.—A return has been printed by order of the House of Commons, from which it appears that the number of stamps issued for newspapers in the year 1850, at one penny, was, in England, 65,741,271; in Scotland, 7,643,045; and in Ireland, 6,302,728. At one half-penny, the number was, in England, 11,684,423; in Scotland, 241,045; and in Ireland, 43,358. The number of newspapers in the United Kingdom, in 1850, was as follows:—London, 159; English provinces, 222; Scotland, 110; Ireland, 102—total, 593. The number of advertisements in them was 2,252,550, of which the London newspapers contained 891,650; the English provincial papers, 875,631; the Scottish papers, 249,141; and the Irish papers, 236,128. The rate of duty is 1s. 6d. on each advertisement, except on those contained in the Irish newspapers, in which the rate of duty is 1s. The total amount of duty paid last year, was £163,038.

From the Morning Chronicle, 26 May.

ALLIANCE OF RUSSIA, AUSTRIA, AND PRUSSIA.

CONSIDERABLE importance will, it is probable, be attached on the Continent to the journey of the King of Prussia to Warsaw. The present meeting of the two sovereigns is at least a sign of the revival of those cordial relations which had been interrupted in consequence of the part played by Frederick William in the events of 1848. At that period the political ties which had existed between the two courts since 1813 were suddenly broken, and when the King of Prussia adopted the revolution, he found himself placed in a position scarcely short of open hostility with the czar. There were doubtless moments in which the language of Russian diplomacy assumed a tone of menace and intimidation—whilst the popular assemblies of Germany were incessantly preaching a crusade against Russia. The subsequent attempts which were made by the Prussian government to carry out the scheme of German unity through the medium of the Erfurt Parliament, did not meet with greater favor at St. Petersburg. The differences between the two governments still subsisted, and in the struggle of the past year the sympathies of Russia were on the side of Austria. More recently a reconciliation appears to have been effected, which must be ascribed rather to the sudden change of Prussian policy than to any caprice on the part of the emperor. There can, indeed, be but little ground for genuine sympathy between monarchs so opposite in character; but it is probable that the czar has been propitiated by the ready deference yielded to his mediation in the autumn of last year, and that he deems the moment to have arrived for the establishment—we will not say of a Holy Alliance—but of a good understanding among the absolute and military sovereigns. Some alarm may be felt at the prospect of such a combination; but in these days the personal agreements of princes are not all powerful, nor, perhaps, is there much reason to fear the permanence of any arrangement to which the King of Prussia is a party. Yet the meeting of the courts at Warsaw is so far of evil omen to Germany, as it shows that no hesitation is felt in soliciting foreign counsel, and perhaps foreign assistance, in the government of the German people. It is impossible to regard the interviews of the Emperors of Russia and Austria and the King of Prussia with the same complacent satisfaction with which we are accustomed to contemplate the visits of courtesy paid by our own sovereign. On the continent these things cannot be separated from political objects, and as they afford just ground to suspect the exercise of foreign influence in the domestic affairs of the confederation, they naturally excite feelings of distrust and jealousy. Regarded from this point of view, the royal visit to Warsaw becomes a national humiliation, and, notwithstanding the present tranquillity, it will hardly produce increased respect for the monarchical principle in Germany.

It seems to be the peculiar curse of that country that the struggle of principles cannot be carried on by the unassisted energy of the Teutonic race. The democratic party is accustomed to lean on the republicans of France, whilst the rulers court the sympathies of Russia. In other countries foreign support brings certain destruction to the political party, or to the government, which has recourse to it; but the national sentiment of Germany is not yet sufficiently strong to condemn such alliances.

The question of peace and war last year was virtually decided by the emperor, for though a considerable show of opposition was made, and though many months were consumed in unprofitable discussion, the solution which was finally accepted was pretty much the same as that recommended by the czar to Count Brandenburg and Prince Schwarzenberg. It is not less notorious that the settlement of the Danish question has been mainly owing to the remonstrances of Russia—a proof that the German governments were either too weak to maintain the rights which they claimed, or too dishonest to respect treaties contracted with a power which they believed to be defenceless. Whichever may have been the case, the sequel has shown that, in the external relations as well as in the domestic affairs of the confederation, the advice of the czar carries with it greater weight than the interest or the ambition of German sovereigns. It is difficult to find fault with the conduct of Russia; for her policy has, upon the whole, been moderate, and her active intervention in Hungary only took place at the pressing solicitation of Austria. Her present position has been forced upon her by the disunion and weakness of her neighbors, rather than acquired by her own activity. The assistance which she rendered to Austria was not, indeed, purely disinterested, because the Russian territories were threatened by the revolutionary contagion; nor do we yet know to what extent Austria may have consented to permit the encroachments of the czar in the Danubian provinces. But the Russian armies were set in motion ostensibly to aid an allied government; and although they made a demonstration of military force which might well cause alarm to other European powers, they were withdrawn when their task was accomplished. The emperor performed an important part in the suppression of the revolution, and it could not be laid to his charge that he had extorted an indemnity from his exhausted and helpless ally. In the grievous errors which produced the Hungarian insurrection the Russians were in no way implicated, nor were they disgraced by the severities with which the excesses of the revolution were avenged. The Hungarian campaign was a complete Russian triumph; and it cannot fail to have strengthened immeasurably the influence of the czar in Eastern Europe. It is a fatal indication of the weakness of Austria that, in the hour of danger, she must look to the Court of St. Petersburg to uphold the dominion of the House of Hapsburg in the valley of the Danube. Whether this state of things be considered as the natural fruit of revolution, or as the consequence of Austrian misgovernment, we cannot escape the conviction that Russia has acquired a dangerous preponderance in countries where the Court of Vienna might have aspired to at least an equal influence.

With the other powers of Germany, the influence of Russia, though less marked, appears to have been scarcely less effectual. The explanation of this result does not lie in the peculiarly aggressive character of Russian diplomacy, but in the simple fact that, whilst the governments of the confederation have been distinguished by their want of purpose, if not by their falseness—whilst the sovereigns were, at one moment, suppressing insurrections, and at the next humbling themselves before the revolution—the policy of the czar was throughout clear and consistent. Unshaken by the revolutionary movements, he not only rendered assistance where it was most needed, but he did his

utmost, and that successfully, to prevent a civil war in Central Europe. We are accustomed to hear denunciations of the policy of Russia, but we must confess our gratitude to the imperial autocrat for having frustrated the dangerous schemes of some very accomplished German statesmen; and we are bound to admit that we are in a great measure indebted to the Court of St. Petersburg for the preservation of the peace of Europe. We would hope that something has been accomplished by the innumerable mediations undertaken by Lord Palmerston; but, upon the whole, the credit mainly belongs to Count Nesselrode and his sovereign. It may be that the czar is less *exigant* than the House of Commons, and possibly his minister for foreign affairs is more temperate than the noble member for Tiverton; but at any rate it cannot be doubted that the governments of Germany turn a deaf ear to the representations of our foreign-office, whilst they submissively follow the advice of Russia. Our national pride might indeed be flattered if England held the same place in European estimation as that which is now occupied by the great northern empire; but it would be far better that the princes of Germany should learn to dispense with foreign dictation or protection. We readily allow that Russian influence has been beneficially exerted, but it is not the less dangerous on that account; and every time that it is exercised it adds to the strength of the power from which Europe has most to fear, whilst at the same time it weakens those governments who are for the moment benefited by it. It is a bitter comment on the projects of German unity which have been discussed in the palaces and the market places throughout the territories of the Confederation, that the discord of that country should have been appeased only by the calm and sagacious advice of the hereditary ruler of the least civilized race in Europe. It is impossible to hope for political development concurrently with such national degradation.

From the Spectator, 24 May.

CONFERENCES are in progress on the confines of Russia and Germany, which may have important consequences for the international arrangements of Europe. The czar is giving audience to his great vassals, Prussia and Austria. The King of Prussia had an interview with his suzerain at Warsaw, on the 18th instant, and the Emperor of Austria was to be admitted to the same favor at Cracow. These interviews augur little good for the liberties of Germans, Slavonians, Magyars, and Italians. But the "divided councils" also augur as little good for the dignity and independence of the Prussian and Austrian crowns, as the "divided councils" held by Richard the Third did for the safety of Hastings and Stanley. The czar consults apart with the King of Prussia and the Emperor of Austria; the policy of Russia is to keep these powers in a state of mutual jealousy, that may enable it to play off one against the other.

Two arrangements in the international relations of Europe are pretty sure to be discussed if not settled at these Polish conferences. The first relates to the affairs of Denmark, which has become little better than an outpost of Russia. The second relates to the affairs of Greece. It is now certain that King Otho will before long abdicate the throne of that kingdom; his brother declines to go over to the Greek Church, and is consequently

ineligible as his successor; the next candidate on the list is the Duke of Mecklenburg-Strelitz, whose intimate affinity to the Russian Autocrat renders his success scarcely problematical. With the change of dynasty in Greece it is understood that a question in which this country has a direct interest is also to be mixed up—the future disposal of the Ionian Islands.

The conferences at Warsaw and Cracow are also watched with uneasiness from Constantinople. The delicate negotiations respecting the disposal of the Hungarian refugees at Kutayah have added to the disquiet with which the Porte regards the tampering of Russia and Austria with its insurgent or disaffected subjects on the respective frontiers of these powers. And recent events in Egypt are understood to have given a fresh stimulus to a project which has been oftener than once, though always vaguely, spoken of—the erection of the Isthmus into a neutral territory, under the common protectorate of the European powers, as the great highway to the East.

When viewed in connexion with these movements and rumors, considerable interest attaches to the publication in a Brussels paper of what purports to be a note addressed by the papal secretary to the Austrian minister of foreign affairs. The authenticity of the document has not been called in question, although it has now been upwards of a week before the public, and has been made the subject of comment both by English and French journals. It is in substance a labored argument, addressed to the Austrian government, with a view to induce it to embrace active measures to turn the French out of Rome, and take the Pope and the States of the Church under its immediate protection.

THE TEMPEST PROGNOSTICATOR.—That leeches are sensitive to thunder-storms is well known. Cowper, the poet, gives an interesting account of a leech which he kept as a barometer, in a letter to Lady Hesketh, Nov. 10, 1787:—"Yesterday," he says, "it thundered, last night it lightened, and at three this morning, I saw the sky red as a city in flames could have made it. I have a leech in a bottle which foretells all these prodigies and convulsions of nature. Not, as you will naturally conjecture, by articulate utterance of oracular notices, but by a variety of gesticulations, which here I have not room to give an account of. Suffice it to say, that no change of weather surprises him, and that in point of early and accurate intelligence he is worth all the barometers in the world. None of them all, indeed, can make the least pretence to foretell thunder—a species of capacity of which he has given the most unequivocal evidence. I gave but sixpence for him." Dr. Merryweather of Whitby in Yorkshire has constructed what he calls a Tempest Prognosticator, with leeches for the basis of the plan. He arranges a frame of twelve bottles, each containing a leech, and each having an open tube at the top. From a piece of whalebone in the opening of each bottle proceeds a brass chain, communicating with a bell hung in the top of the apparatus. Accordingly, when a tempest is approaching, the leeches rise in the bottles, displace the whalebone, and cause the bell to ring. Hitherto, after a year's experience, it is found that no storm escapes notice from the leeches. Dr. Merryweather has also satisfied himself that it is the electric state of the atmosphere, and not the occurrence of thunder within human hearing, which affects the leeches. After this the Snail Telegraph looks not quite so outrageous an absurdity.—*Chambers' Journal*.

PRESBYTERIAN SYNOD OF BELFAST.

At a meeting of the Presbyterian Synod of Belfast, the Rev. S. M. Dill read a series of resolutions on the subject of Papal aggression, amongst which were the following :—

That, in the opinion of this synod, there is good cause for the serious alarm which has been excited in these countries by recent efforts to extend the principles and power of Popery, and that it appears to be a present duty for this church to bear testimony against its anti-Christian assumption. That, holding Christ to be the sole Supreme Head of his Church, we feel bound to protest against any invasion of his rights, either on the part of prince or pontiff, and, especially in the present times, to maintain before the world the spiritual independence of the Church, and the liberty wherewith Christ hath made his people free; and that, valuing religious liberty for ourselves, we disclaim any disposition or desire to interfere with the religious liberties of any portion of her majesty's subjects. That we cannot but regard the recent proceedings of the papal court as having been encouraged by the countenance and patronage accorded to Popery in various forms by the British government, as well as by the Romanizing tendencies of the Tractarian party of the Church of England.

The Rev. Mr. Knox seconded the resolution.

The following is an abridged report of the discussion which ensued, as given in the *Belfast Banner* :—

Dr. Coulter.—My only ground of objection is, that the second resolution regarding royal supremacy does not carry out the protest in its application to the great present system of anti-christianism. We have heard a great deal of the great antichrist, but I regard the whole of the Church of England system as one—

Dr. Cooke.—I at once call the speaker to order. I am sorry, indeed, that I have to oppose a man so highly respectable as Dr. Coulter; but I tell him again that it is the Church of Rome that is before us, and not the Church of England, and if Dr. Coulter wishes to introduce any number of substantive resolutions in relation to the Church of England, I am ready to hear him—to submit to him when, as a Presbyterian, I think him right—to oppose him when, as a Protestant, I think him wrong. Popery is the question, and not prelacy—Popery is the question and not the constitution of the Established Church in England and Ireland; and even if I were to stand alone, I would oppose this sinister mode of assailing the Protestant Church, when our object is to turn aside the tide of that Popery which is now sweeping over the land, and which, when it attains sufficient strength, if allowed to do so, will sweep away Dr. Coulter, and those who join with the friends of Rome [applause].

Rev. Mr. Rogers.—Moderator, I have to appeal to you on two grounds. I ask you, are the proceedings of this court to be interrupted in such a manner by the public?

The Moderator.—Certainly not.

Mr. Rogers.—And in the second place, I wish to ask has Dr. Cooke any right here to impute motives such as he imputed to Dr. Coulter?

The Moderator.—I am not aware that he did so. Mr. Rogers.—He imputed sinister motives, and I—

Dr. Cooke.—Oh, sir, Dr. Cooke was never afraid of an enemy.

Mr. Rogers.—And I ask, is he in order in doing so?

Dr. Cooke.—I imputed no motives. I said that

a sinister and left-handed mode had been taken of turning attention from Rome by attacking the Established Church, and I say so still. If Dr. Coulter wanted to go dexterously and right-handed about the matter, why did he not take the proper course?—his proper course would have been to introduce substantive resolutions. I did not impute motives, however I may have wished to advise him, and my advice might do him good, however he may be accustomed to rub his elbows to the creashy priests of the south.

Mr. Rogers.—This is most unfair—I don't care from what person it proceeds, it is unfair thus, at the close of the synod, to offer opposition, and attempt to smother a resolution which, if Dr. Coulter had introduced yesterday, would have been carried triumphantly, and Dr. Cooke knows it would.

Dr. Cooke.—I know no such thing, sir.

Mr. Rogers.—Dr. Coulter has a perfect right to take the ground he is taking at present. He is doing no more, attempting no more, than Lord John Russell has done—Lord John Russell, whose policy Dr. Cooke comes here to support.

Dr. Cooke.—I will not endure that Mr. Rogers shall make such assertions as these. I do not—

Mr. Rogers.—Lord John Russell, who insults the prelates of the Church of England more than Popery in his letter to the Bishop of Durham. I have no objection to come forward here to denounce Popery in all its shapes and phases, but I will also denounce what I consider far worse than heresy.

Dr. Cooke.—Let Mr. Rogers try to put upon my statement and my conduct an interpretation that I never intended. Me support Lord John Russell! The house of Russell to require support from me! Oh, no. I have a high respect for Lord John Russell. I believe him to be one of the first statesmen in Europe. I believe him to be a good theologian. He goes frequently to a Presbyterian house of worship.

Mr. Rogers.—And more frequently to Mr. Bennett's congregation.

Dr. Cooke.—But as to supporting Lord John Russell, I wish I had the supporting of him, and I know where I would support him to. As to his proposed measure, I believe it is the most miserable and puny embryo that ever came to shape or form, and as to arriving at the full stature of a man, why, it will never be a manikin.

After some further discussion, Dr. Coulter was called upon to submit his amendment.

Dr. Coulter then read the following, as his amendment :—

Resolved.—That this synod also feels constrained to testify against the assumption of the royal headship and supremacy in ecclesiastical and spiritual affairs, together with the prelatical hierarchy, as by law established, in the Church of England and Ireland; and also, against the assumed power of appointing to church offices on the part of the crown, of government officers or private patrons. This system we regard as sinful, opposed to the word of God, and involving great evils. This system we regard as opposed to the headship and supremacy of our Lord Jesus Christ, who is the sole and exclusive Head of His Church. We regard this system, moreover, as subversive of that order and government which Christ has set up in His Church, and as opposed to those rights and liberties which Christ has in His word conferred on the Christian people, as distinguished from Church officers. This system keeps the Church in captivity; it enslaves the people, and generates and perpetuates a slavish spirit. "The reformation of religion in the kingdoms of England and Ireland, in doctrine, wor-

ship, discipline, and government, according to the word of God, and the example of the best reformed Churches, and the endeavor to bring the Churches of God in the three kingdoms to the nearest conjunction and uniformity in religion," the continuance of this system renders an apparently hopeless impossibility. This system we regard, moreover, as bound up with the propagation and perpetuation of grievous doctrinal errors. Along with other and kindred causes, it operates in the enslavement and oppression of the people, and also in the maintenance of various corruptions and abuses. The monopolizing, exclusive, tyrannical, and persecuting spirit of this system (though happily checked in these lands, under God, by counterworking causes and influences) is carried by its agents into the numerous and widely-spread colonies of this empire; and it generates, multiplies, and perpetuates the same national sins, errors, grievances, bondage, and servility in our colonies that it does in the mother country. This system is embodied in our constitution, enacted by law, supported by vast endowments, and maintained by the immense power and resources of the British empire. Against this system in its being, aggressions, and persecutions, our fathers maintained a faithful and persevering testimony, even with confiscation of goods, imprisonment, banishment, and blood. And against this system we hereby, in the present circumstances of these lands, renew our testimony, if, through the blessing of God, it may be the means of turning the minds of our rulers and people to a consideration of these sins, errors, and evils, that they may come to the acknowledging of the truth, and to make consequent reformation.

Dr. Cooke.—Well, this is one of the lamest cases that ever was proposed; and I again use the words sinister and left-handed—I use them advisedly—

Dr. Coulter.—I altogether deny the accusation of Dr. Cooke. I appeal to my brothers in the synod if this—

Dr. Cooke.—You cannot stop me.

Dr. Coulter.—I deny your accusation.

Dr. Cooke.—I permit you to deny it, but still you cannot stop me. Our resolutions were submitted to a committee of overtures, and we could not have introduced them here if that course had not been taken. Dr. Coulter did not take this course. By a sinister—

Dr. Coulter.—Again I must complain. I deny the applicability of the term.

Dr. Cooke.—I am not attributing motives to or making charges personally against Dr. Coulter. I believe him to be an honest man; and, more, I believe him to be a deceived and misled man. Dr. Coulter is the last man to whom I would impute motives; but we were required, in introducing this matter, to lay it before a committee of overtures; and are we to be told that Dr. Coulter is to be at liberty to introduce matters without taking such preliminary steps?

Mr. Rogers.—You have denied that you imputed sinister motives to Dr. Coulter. To whom, then, did you apply them?

Dr. Cooke.—I don't know to whom. I applied them to that strange person "Somebody."

Mr. Rogers.—I heard Dr. Coulter's amended resolution read. I beg to second it, and I ask, are you ready to receive it?

Dr. Cooke.—It cannot be moved or seconded. It cannot come here until carried through the alambic of a committee of overtures.

Mr. Rogers.—As Dr. Cooke wished Dr. Coulter better company, may I ask if he alluded to me, and ascribed to me the honor—

Dr. Cooke.—I did not ascribe to you the honor. I do not ascribe to you any honor.

Mr. Rogers.—All I can say in return, if he meant, me is that I wish Dr. Cooke better company than he sometimes has.

Dr. Cooke.—I wish I had better now [loud laughter].

Mr. Rogers.—And I hope Dr. Cooke will not forget the burden of the old song, "Duncan was a lad o' grace" [continued laughter].

A long and, at times, somewhat angry discussion followed. A question arose as to whether Dr. Coulter's resolution could, according to prescribed rule and form, be received; its reception was negatived, and subsequently the original resolutions were adopted, with only one dissentient.

The synod concluded its sittings soon after eleven o'clock. The proceedings were closed with prayer.

From the Times, 19 May.

CABMEN.

THE great difficulty in dealing with the cabmen of London has hitherto consisted, not so much in the absence of a remedy, as in the annoyance which is involved in seeking redress. Let us suppose that a stern, middle-aged gentleman in the city has been overcharged some sixpence or fourpence for conveyance from Cornhill to his suburban retreat at Brixton or Clapham; how can he avoid or punish the extortion? Evidently his only course, if he would escape from half an hour's altercation with his driver, and partake of a hot dinner, is to hold out a handful of silver, desire the cabman to pay himself, take his number, and summon him the next day to Bow-street. The end of the whole transaction will be, that the aggrieved party, if he would obtain redress, must waste some hours of one day and the whole forenoon of the next in attendance at a police-office. He will, no doubt, in the end, have the satisfaction of listening to a caustic rebuke addressed by the magistrate to the repentant Jehu. He will obtain restitution of his fourpence, and, in all probability, if he have any of the milk of human kindness about him, will be the first to intercede with the magistrate that the pecuniary penalty inflicted may be reduced to the costs of the summons. Such is the ordinary routine of an application to Bow-street. To carry the transaction to a satisfactory issue is to make a great sacrifice on the altar of patriotism. As far as the individual may be concerned, the sum of fourpence is all he obtains as compensation for his absence from 'Change or from Capel-court while the most eventful "bull" or "bear" transactions are in full progress. Still a divine wrath may possess the mind even of a hard-headed stockbroker, and, under the influence of such feelings, he may follow up an extortionate cabman to the death. But, let us turn from these cases to another hypothesis—one which is of far more frequent occurrence in practice. A lady with her children has been out a-shopping or walking. The party are caught in a shower of rain; and, in an evil moment, the misguided matron holds up a tremulous finger to the conductor of the first rickety convenience which may be lumbering by. She, like our friend the stockbroker, on arriving at her own house is overcharged. Who shall assist her in her sore distress? Her husband and her eldest son are from home. The cabman has cast the proffered shilling on the pavement, and is executing round it a mad Ojibbeway

dance, to the infinite diversion of the housemaids at 51 and 53, to make no mention of the boarding-house opposite, the inmates of which have gathered together at the windows with every appearance of the liveliest interest in the dispute. As a matter of course, the lady in question pays half-a-crown, five shillings—anything which may be demanded of her. When the head of the family returns from business he is informed of what has taken place. Visions of the judgment-hall instantly flash before his eye. He is standing before Mr. Hardwick or Mr. Trywhitt, with his wife and his little ones, recounting his wrongs and claiming redress. But, in order that these dreams may be realized, it is necessary that his timid consort should be produced in open court. She must take off her glove in the presence of an indefinite number of stern policemen and perspiring spectators, and recount the history of her disasters to a matter-of-fact magistrate. Who would expose a lady to such an ordeal for the sake of five shillings—it may be of sixpence! Thus, after an evening spent in expostulation on the part of the lady, and Roman sternness on that of her lord, the affair is closed by the husband over the dry toast next morning making a few sneers at the weakness of women, and a short but comprehensive wish for the comfort of cabmen in general in a future state of existence. Practically, the cabman has extorted what he wished, and he is *not* summoned to Bow-street or elsewhere.

Thus it is clear that the most excellent code for the regulation of cabs and cabmen may be in existence, and still its provisions may utterly fail from the want of some summary, ever-present jurisdiction, which may apply the principles in practice. This defect in procedure has now been amended by the commissioners of police. A notice to the public, bearing the signature of Mr. Commissioner Mayne, has just been published, which contains, among others, the following proviso:—"The police at the standings will give information as to the proper fares." This regulation appears, at first sight, sufficiently curt and unsatisfactory. To conceive the real value of the improvement introduced, it must be considered that it is the intention of the commissioners of police to furnish the policemen on the various beats with a little book containing the tariff of fares from all the principal stands and points of departure in the metropolis. Thus the policemen on duty at the Exhibition will be furnished with the tariff of fares from the Exhibition to all the principal points in London; or, of course, *vice versa*. By this arrangement a summary arbitrator will always be forthcoming, who will be willing and competent instantly to adjudicate upon any question of disputed fare; and, in case of pertinacity on the part of the cabman, to suggest the nearest station-house as the termination of his next drive. Such, in a word, is the machinery by which the commissioners of police hope to put an end to the system of extortion on the part of cab-drivers. We know not how any suggestion could be offered for the improvement of the scheme beyond the one which has already appeared in our columns, for making the policemen or watermen—we need not quarrel about names—stationary at the various stands. This, however, is a point upon which experience alone can decide. In all probability, the commissioners are right, in the first instance, to make use of the machinery as it is ready to their hands. Should the slightest practical difficulty occur in finding a policeman at any of the principal stands when he should be forthcoming,

a very simple modification of the system proposed will be quite sufficient to meet the difficulties of the case. It is almost superfluous to add that the powers of the police will not be confined to instances of extortion. They will be directed to act summarily in most of the cases which at present necessitate an application to a magistrate, or, at least, to take the responsibility of action upon themselves, in place of throwing it upon the party aggrieved.

From the Gentleman's Magazine.

JERUSALEM, MY HAPPY HOME.

THE inquiries we have set on foot respecting the original of the hymn, "JERUSALEM, MY HAPPY HOME!" have not yet terminated, but, in the mean time, we have received several communications upon the subject, some of which put the matter in a new light. Dr. Dobbin, of Hull, writes to us with various particulars respecting David Dickson, to whom he believes the authorship is justly ascribed, but states that he wrote the first line,

Oh, mother dear, Jerusalem!

in reference to Galatians iv. 26.

This last conjecture or recollection is confirmed by a valuable correspondent, signing H. G., who says that "in an edition of Dickson's Truth's Victory with his life by Wodrow, Glasgow, 1772, 12°. occurs the following passage (Life, p. xxi). Wodrow says, he (Dickson) wrote 'some short poems on pious and serious subjects, which, I am told, have been very useful, when printed and spread among country people and servants; such as The Christian Sacrifice; O, mother dear, Jerusalem! and on[e] somewhat longer, 8vo. 1649, entitled True Christian Love; to be sung with the common tunes of the Psalms.'" Wodrow's life is dated "Eastwood, Jan. 5, 1726."

Mancuniensis informs us that, in the Life of Jessey, who died September, 1663, it is mentioned that on his death-bed "He sung this hymn:

Jerusalem, my heart's delight,
I come, I come to thee;
Then shall my sorrows have an end,
When I thy joys shall see.

This, doubtless, is the same hymn, it having experienced such alterations as are the usual fate of hymns."

Other correspondents introduce to our notice a new claimant to the authorship of this hymn in the Rev. William Burkitt, the well-known author of the Exposition on the New Testament. This claim was first brought before us by a correspondent signing W. B. B., who, writing to us from Hackney, on the 18th February last, informed us that "not many months ago, he heard the late Dr. Pye Smith state, without any expression of doubt, that this hymn was written by Burkitt." He adds, "I need not inform any of your readers who knew that venerable man, how accurate was his knowledge respecting hymns, and how scrupulous he was in assigning them to their rightful owners." A month afterwards, the same correspondent kindly sent us a copy of the hymn as it appears in "A Help and Guide to Christian Families, containing Doctrinal Instructions, &c., &c., also Divine Hymns, on several occasions. By William Burkitt, M. A., of Pembroke Hall, late Vicar of Dedham in Essex. A new Edition, Colchester, 1819." The preface is dated, 1693.

A few days after we had received this communi-

cation, we were favored with one of a similar purport from a lady, who is descended from Burkitt. She informed us that her family had always been proud to recognize this hymn as the composition of their ancestor, and favored us with a copy of it, extracted from "the 27th edition of the Help and Guide to Christian Families, printed in 1749. The book was first published 9 July, 1683." There are variations between the copies furnished us from the editions of 1749 and 1819, and probably still more differences would be found if the latter were compared with the edition of 1693.

Burkitt's version of the hymn resembles, but is not all identical with, that found in modern collections, as, for example, that in Bickersteth's *Christian Psalmody* (70th thousand, No. 574) and that in *Montgomery's Christian Psalmist** (3d edition, Glasgow, 1826. 18mo.; 8th edition, Glasgow, 1837, 12mo.) How much of it was actually Burkitt's may probably appear when we find the hymn set forth by Dickson.

H. G. sends us also another version found by him in "an Appendix (without date) to Hymns for the Poor of the Flock." London, 1841. 24mo. This version in some respects very nearly resembles that printed in the *Gent. Mag.* for February, 1798. Perhaps the editor of this collection will tell us whence he derived his copy.

H. G. also sends us extracts from various Latin hymns, "to which the English composition bears at least in parts a very strong resemblance." This is a portion of the subject to which we hope to return.†

[Perhaps the old lady in the Entail is not good authority—but she sang it "O, mother dear," &c. *Liv. Age.*]

NEALE'S MEDIEVAL HYMNS.‡—Of all our living writers, there is none whom we know who at all approaches Mr. Neale in versatility. Sometimes we see the ponderous history, which would have been the sole life's work of any other writer—it is trodden upon by the tale, or rather the cloud of tales, for which our nurseries are generally so eager. Then come the ballads, and the pamphlets, and the translations, till we absolutely fail in our enumeration. In the little volume before us, the last which has appeared with his name, Mr. Neale turns to good account at once his critical acumen and his poetical talent, in a series of very accurate and at the same time spirited

* H. G. points out to us, that in the Introductory Essay prefixed to *Montgomery's Christian Psalmist*, the hymn is thus alluded to: "There is a delightful hymn, page 134, 'Jerusalem, my happy home,' &c., by an unknown hand: but the hymn itself ought never to be unknown where there is a church on earth training up candidates for the church above."

† Referring to the *Magazine* for December, 1850, H. G. points out that the verses there printed are attributed in one place to E. B. P., and in another to F. B. P. Presuming E. to be a misprint, and, "as it was not usual for an individual to have two Christian names at the period of the date of the MS. referred to," our correspondent supposes the F. to stand for "Father." The initials ought to be F. B. P. But may not the "P.," with equal if not greater probability, be supposed to mean "Poet?"

‡ Medieval Hymns and Sequences, translated by the Rev. J. M. Neale, M. A. London: J. Masters, 1851. 16mo.

translations of some of the best of those far too long neglected gems of natural poetry, often of the highest order of excellence, both in diction and in sentiment—the metrical and rhyming hymns of the middle ages. Their writers having been compelled to adopt in these compositions new idioms and inflections to suit a form of religion and a state of feeling and of society totally different from that in which the Latin language had attained its maturity, critics of a less philosophic period than our own, nurtured in a mere pedantic study of Cicero and Horace, were fain to repudiate the entire literature of mediæval poetry as barbarous and worthless. A more discriminating age has now succeeded—the late Bishop Mant and many others led the way in introducing them to the reading world in an English garb. No one, however, has equalled Mr. Neale in this work, and we therefore trust that we may see many more specimens of his talents in this, as well as in the other branches of literature, to which he has devoted himself.—*Morning Chronicle.*

THE DEAD.

THE dead are everywhere!

The mountain-side, the plain, the wood profound,
All the wide earth, the fertile and the fair,
Is one vast burial-ground!

Within the populous street,
In solitary homes, in places high,
In pleasure-domes, where pomp and luxury meet,
Men bow themselves to die.

The old man at his door,
The unweaned child, murmuring his wordless song,

The bondmen and the free, the rich, the poor,
All—all to death belong!

The sunlight gilds the walls
Of kingly sepulchres enwrought with brass;
And the long shadow of the cypress falls
Athwart the common grass.

The living of gone time
Built their glorious cities by the sea,
And, awful in their greatness, sat sublime,
As if no change could be.

There was the eloquent tongue;
The poet's heart, the sage's soul was there;
And loving women with their children young,
The faithful and the fair.

They were, but they are not,
Suns rose and set, and earth put on her bloom,
Whilst man, submitting to the common lot,
Went down into the tomb.

And still, amid the wrecks
Of mighty generations passed away,
Earth's honest growth, the fragrant wild flower,
decks
The tomb of yesterday.

And in the twilight deep
Go veiled women forth like her who went,
Sister of Lazarus, to the grave to weep,
To breathe in low lament.

The dead are everywhere,
Where'er is love, or tenderness, or faith;
Where'er is pleasure, pomp or pride; where'er
Life is or was, is death!

THE LIVING AGE is published every Saturday, by E. LITTELL & Co., at the corner of Tremont and Bromfield Streets, Boston. Price 12½ cents a number, or six dollars a year in advance. Remittances for any period will be thankfully received and promptly attended to.